The Chemical Age

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Search for Petroleum in Britain

"FACILIS descensus Averno," sang the old Latin poet—but then neither he nor his compatriots had ever bored for oil. It is an illuminating example of the principle of relativity that whereas man can dive with safety through the air at so great a speed that he traverses a mile in less than nine seconds, to bore even a small hole a similar distance through the earth's crust occupies him a year. It is not without significance that both these achievements may be of equal importance. Rapid flight through the air at speeds in the neighbourhood of 400 miles per hour have afforded information that has enabled the design of aircraft to be substantially improved, whilst the slow and painful task of probing the earth's crust may provide the motive power that enables that same aircraft to rise into the air and without which it is, and must remain, useless.

In this last fact lies the significance of the event which took place last week, when the first deep borehole ever to be put down in this country was started. The borehole has an upper diameter of 23 in. and will gradually narrow as the depth increases. A derrick 135 ft. high serves as the starting point from which to operate a rotary drill above which is a 3½-ton travelling block and a hook weighing 2 tons; the rotary swivel also weighs 2 tons. The plant is to be operated by boilers which have a steaming capacity of 14,000 lb. per hour at 250 lb. pressure.

This is not, of course, the first attempt to discover oil in England. The Geological Survey has examined the rock structures on earlier occasions, and, because the Survey deals with the surface rocks which can be mapped by the usual or "classical" methods of geology, no real hope could be held out of the discovery of oil in paying quantities. Nevertheless, the late Lord Cowdray and his staff in the days towards the end, or just after, the war, made a determined effort to ascertain if some of the indications of oil in the coalfields were anything more than unsubstantial shadows. These and other intermittent efforts have resulted in only one trifling success—the oil well at Hardstoft, in Derbyshire, which is still yielding oil in small quantities derived from the rocks associated with the carboniferous strata. Possibly this is seepage from a greater reservoir, but though a number of boreholes have been put down in the vicinity, the parent reservoir, if it exists, remains untapped.

This present borehole, just commenced at Portsmouth, is not associated with the coal measures, but is in a locality where, so far as is known, coal does not exist. Sir John Cadman, at the opening ceremony, explained that the position of the borehole and the decision to proceed with it had been taken from the evidence secured by the Anglo-Iranian Co.'s geologists using the latest geological methods, in which, as Sir John pointed out in his presidential address to the Institute of Petroleum Technologists, there has recently been great advances. A volume of evidence has been obtained which shows that many miles to the east and to the west of the spot chosen there are outcrops of wealden and pre-wealden (Lower Cretaceous) age which in certain places are heavily impregnated with petroleum. The venture is necessarily speculative as all oil boring must be, but it is hoped to find that the impregnated rocks are porous and suitably folded so as to form a reservoir in which the petroleum has been trapped in commercial quantities.

It seems likely from the remarks of the Minister of Mines that when the Act of 1934 was passed to regulate and to encourage a purely hypothetical home petroleum industry, there was already some indication that oil might not be absent. The many who regarded this Act as unnecessary, including, if truth were told, ourselves, will be the first to congratulate the Anglo-Iranian Oil Co. if the venture proves to be a success. Unquestionably one of our most pressing problems is the provision of a home supply of oil which cannot be cut off by enemy action. The large-scale hydrogenation plant at Billingham owes its inception to this need; if Britain is added to the list of petroleum-producing countries, will this plant still be operated, or will a new chemical industry disappear, strangled at birth? The effect on the price of benzol and on the prospects of oil as a by-product of low temperature carbonisation will also depend upon the success or failure of the Portsmouth oil well. If oil is found in adequate quantities, there will be less loose talk about oil-from-coal schemes. What of the coal industry? If oil is found in quantity, will there still be the same strident cry for heavy taxation of oil on the ground that it is affecting the consumption of coal? Those who fear these things may take heart. Sir John Cadman has stated that in spite of all the advantages of modern science, the drillers are going forward as pioneers into the unknown. It is, indeed, doubtful whether sufficient oil is likely to be found in this country to render us independent of other sources, and it is more probable that there will be a place for both the natural and the chemically manufactured oil. Even in the home of natural gas and oil, the United States, inventors are still busy with low temperature carbonisation plants and other methods of producing oil from coal, and power alcohol from water gas derived from coke.

Notes and Comments

The Coming Budget

BUDGET day rapidly approaches—a day of reckoning for the increased expenditure that the nation is about to undertake. Fortunately the Chancellor ends the year with a substantial balance in hand, due largely to the improved trade of the past year or two. The Federation of British Industries has followed its usual custom of putting the view of its members before the Chancellor in order to afford him some guidance as to the directions in which taxation will assist, or will do least harm to, industry in general. It was to be expected that the Federation would ask for income tax reduction. There are few taxes that press more hardly upon those who would accumulate reserves than this one, but there are also few which Chancellors as a species seem more inclined to perpetuate. In view of the known belief among the working classes that only the rich pay income tax, this diffidence can be forgiven; income tax when it comes back to its source, however, usually means in the long run that the business of the country is hampered because the money that should have gone into new ventures or in giving stability to established ventures, disappears in January or in July. In the long run the effect of income tax comes back on to those who earn their living and pay for what they use and eat. The Federation has also urged that the present high taxation levied by the spirit duty should be decreased, partly because the yield is too high and is preventing expansion of the industry, and partly because a lower yield might bring in more tax owing to greater consumption. Whether greater consumption of potable spirits is desirable, is a point on which we forbear to argue. Unquestionably the reduction of taxation would be not only popular, but sound; the nation is gaining in confidence; this gain would be accelerated if taxation could be reduced. For this reason there is much to be said for the contention that the cost of re-armament should be met by a long-term loan.

Obsolescence

THE vexed question of obsolescence is also referred to at some length by the Federation, not only because of the lack of uniformity in the treatment of obsolescence by the tax inspectors in different parts of the country, but also because obsolescence has now become a greater factor than it was in the past. The increasing pace of scientific discovery and of technical invention is largely responsible for this, but the need to keep abreast of the technical equipment of foreign competitors must also play its part. Obsolescence, indeed, may be more important than wear and tear and it must be taken into account throughout the period when machinery and plant is in use. The chemical industry may find obsolescence more important than do most other industries because it is not only a question of obsolescence of plant and machines, but often of the processes for which they are used, and even of the products they produce. The Chambers of Commerce add that "the Income Tax Acts provide an annual allowance only for wear and tear and take no account of the obsolescence factor until plant and machinery is dismantled and disposed of, and then only if it is replaced. We, therefore, suggest that in place of an allowance merely in respect of 'wear and tear' there should be given an allowance in respect of 'depreciation,' it being understood that this 'depreciation' allowance is to cover obsolescence as well as wear and tear. When the allowances have reduced the cost of the plant or machinery to scrap value, no further allowances would be given."

The Chemical Society at Bristol

FOR the first time in its ninety-five years' history the Chemical Society will hold its anniversary meetings in the West of England this year, and it is hoped that a large number of Fellows and others associated with chemistry residing in that part of the country will attend. The annual meeting and the anniversary dinner will be held at Bristol University on Thursday, the Hantzsch Memorial Lecture will be given by Professor T. S. Moore on Friday morning, and there will be visits to the Agricultural Research Station at Long Ashton, the works of the National Smelting Co., Ltd., at Avonmouth, and the chocolate factory of J. S. Fry and Sons, Ltd., at Somerdale, on Friday afternoon. To ensure that all branches of chemistry and chemical industry are represented, the local sections of kindred societies and institutions and a number of industrial organisations have been co-operating in the arrangements for the meetings, and judging by the strongly representative committee which has been responsible for drawing up the programme the occasion promises to be of considerable interest. Lord Bledisloe has consented to be the principal guest at the dinner. Professor G. Barger will be presented with the Longstaffe Medal for 1936 and Dr. Leslie E. Sutton will receive the Harrison Memorial Prize for 1935.

The Messel Medal

THE Council of the Society of Chemical Industry has decided to award the Messel Medal for 1936 to Sir Robert Mond, who for nearly fifty years has taken an active interest in the chemical industry, and the presentation will be made at the annual meeting in July at Liverpool. The medal is awarded every two years in commemoration of Rudolph Messel, one of the most distinguished members of the Society, to someone distinguished either in science, in literature, in public affairs or in industry, or who has rendered conspicuous service to the Society. Sir Robert Mond, who was knighted in June, 1932, is the eldest son of the late Dr. Ludwig Mond, and was born at Farnworth, Lancashire, in 1867. He was educated at Cheltenham, Cambridge, Zurich and Edinburgh, and became assistant to Sir William Thomson, afterwards Lord Kelvin, at Glasgow. After a few years' experience at Winnington he became works chemist there, assisting his father in many developments, including the manufacture of electrolytic zinc, Mond gas producers and the ammonium chloride process. He has had a vast commercial experience as a director of many companies, and was much engaged in the development of nickel carbonyl, discovered by Langer and Quincke in 1899, and in conjunction with Dr. Hertz and Mr. Cowap, and later with Mr. Wallis, he studied the formation of other metallic carbonyls. In 1907, by working with gases under high pressure, Sir Robert Mond discovered the carbonyls of cobalt, ruthenium and molybdenum.

Problems of Wood Utilisation

A New Raw Material for Modern Chemistry

WOOD as a new raw material for modern chemistry was the subject of a series of papers presented on April 3 at the closing session of the second international conference on timber utilisation, organised in London by the Comite International du Bois, Department for Timber Utilisation, in conjunction with the Timber Development Association of Great Britain.

Dr. FRIEDRICH BERGIUS, of Heidelberg (the inventor of the petrol from coal hydrogenation process in operation at the Billingham works of Imperial Chemical Industries, Ltd.), dealt with the latest results of research and experiments on wood. The problem of chemical utilisation, said Professor Bergius, was of special importance for the wood industry, because some forms of wood utilisation which were formerly extensive had now decreased. He instanced the carbonisation and manufacture of charcoal, from which they formerly won certain acids. New procedures for synthetic production of these had been evolved, and in these coal had taken the place of wood. In the cellulose industry, too, new methods had been worked out which allowed a more economical utilisation of wood.

Sugar and Alcohol

Thirty years ago it was possible by the application of certain acids to obtain sugar and alcohol from wood, and during the war alcohol was extracted from wood in some countries. In all those cases, however, the result was only about a 30 per cent. utilisation, the rest being waste. The new procedure consisted in decomposing wood in a way that gave two-thirds in the form of raw wood sugar and one-third in the form of lignin, without any waste. One kilogramme of raw wood sugar corresponded to one kilogramme of starch in its food value for animals. This was very important because they could use the raw wood sugar for feeding animals and thus make themselves independent to a large extent of imports if necessary.

Wood sugar contained a great many different sorts of sugar. By proceeding to further refinements and transformations the chemist could get out of the raw wood sugar many other products, including wood alcohol, yeast, glycerine and crystallised glucose. The result was that they could obtain grease, proteins and carbohydrates, and thus all the elements necessary for animal feeding and for human alimentation.

Foodstuffs from Forests

Their studies had shown that it was possible to grow on one acre of woodland as much foodstuffs as they could grow on one acre of arable land. He believed it was possible by this modern chemical process to produce foodstuffs cheaper in the forests than on normal arable land. The crystallised glucose, moreover, was better than normal sugar because it was more easily digested. Further, from calculations made they had found that crystallised glucose was cheaper to produce than the same quantity of beet sugar, and as cheap as cane sugar. These statements applied, of course, to countries where great quantities of cheap wood were for disposal. "You could not make it as cheap in England," added the Professor.

In addition to the two-thirds extraction in the form of raw wood sugar, he had spoken of one-third in the form of lignin This was valuable also. Among other things, it could, by compression, be used for building boards. The chemistry of lignins, which was a more or less new branch of chemical knowledge, might offer other important new possibilities.

The work he had been describing was not very welcome in some quarters, but new chemical inventions often met with opposition—the production of synthetic ammonia was an example. Forestry, however, was important for all countries from a national and social point of view. Therefore he felt that if the proper steps were taken and the ground was properly prepared it would be possible to secure for wood the place it deserved as a raw material. Professor Bergius added that in the development of the processes in which he and his collaborators had been engaged, they had received strong scientific and technical help from this country for which they were deeply indebted.

Dr. Friedrich Bergius, who was awarded the Melchett Medal of the Institute of Fuel in 1934.

Wood for Clothing

Professor E. HAGGLUND, of Stockholm, who also spoke upon wood as a new raw material in chemistry, gave some valuable information on progress made in Sweden. A vital change from forestry in Sweden occurred during the war, he said, for the iron industry which had formerly used large quantities of charcoal abandoned this method and went over to the use of coke. Forestry in Sweden, having been adapted and accustomed to finding an important market in the iron industry, was then faced with an entirely new problem.

It was the pulp industry that helped forestry to overcome that difficult situation. At one time the very thin trees could not be used for the production of pulp (they were used only for the production of charcoal), the reason being that for producing sulphite pulp the trees had to be barked, and when these were very thin the loss in barking was so heavy that the raw material became too dear. In recent years the sulphate pulp industry had developed, and for the production of sulphate pulp it was not necessary to bark the trees. Another point was that the production of saw mills was greatly reduced and thus important quantities of wood which were suitable for the sulphite pulp industry became free.

Then the quality of pulp in general had been very much improved. It was only since 1920 that chemical and physical tests had been introduced in the industry, and it was learnt in what direction improvement should go. Important improvements in methods of cooking pulp had taken place and it was possible to differentiate and tell the kinds of pulp fit for different purposes.

If they studied the production curve of artificial silk they would find that production had been constantly rising, and the rising tendency was even maintained during the world economic depression. He did not think that tendency had reached the limit.

A new invention had been made recently, namely, the introduction of the staple fibre. This gave the possibility of producing wool and cotton from wood. What is even more important, the production of the staple fibre necessitated certain rationalisation measures in the production of artificial silk, with the result that it was possible to get a sub-

stantial reduction in the production cost of artificial silk. "We can now produce artificial silk, or what is its raw material viscose, at about one-third of its previous price," added the speaker.

The new staple fibre could be mixed with wool as well as with cotton, and when that was done it was possible to produce new weaves which had entirely new qualities and which meant new cloths. There were two methods of production, the viscose method and the cuprammonium method; by the latter one could obtain a very much thinner fibre, and this again made possible new effects in cloths. They could use sulphate pulp as well for the production of cuprammonium artificial silk.

An important evolution of the pulp industry could be foreseen. It would not go in the direction of greatly increased quantities, he believed, but what would happen would be more and more improvement in the quality of pulp and improvement in the products derived therefrom. If that were so, careful consideration must be given to the quality of wood for the production of pulp. They must have wood of uniform quality. It was bad to use different sorts of wood and to use wood that was grown quickly and was of low density. A certain amount of wood would have to be eliminated from the production of high-class cellulose and pulp. There lay the importance of new means of new chemical utilisations such as Professor Bergius had mentioned.

Dr. J. A. von Monroy, Director of the German Forestry Association, and Central Supervisor of German Forestry and Wood Research, a delegate to the International Timber Conference, travelled from Harwich to London in his car, using wood fuel instead of petrol, and on April 1, used the car for his visit, with other delegates, to the Forest Products Research Laboratory at Princes Risborough.

Dr. J. A. VON MONROY, a German delegate, spoke of the expanding opportunities for wood utilisation. Whereas wood uses formally fell into two main groups—wood as a construction material and wood as fuel—they now fell into five groups: (1) Wood as a construction material; (2) wood as a source of energy; (3) wood as textiles; (4) wood as foodstuff; (5) wood as chemical raw material.

Dealing with the subject under the first heading, the speaker pointed to the virtues of wood and the many qualities which gave it foremost place as a construction material. He spoke of its durability, its qualities for carving, its elasticity, its insulating virtues and so forth. It could be used for roads; and it was extensively used for motor-car bodies and for railway coaches. "Wood," he said, "does not get tired, as other materials do." Moreover, it was suitable where specially resistant qualities were sought, as in the building of aeroplanes.

Wood as a fuel might now be divided into three sections: to be used as fuel in its original form, in its liquid form, and as gas. Speaking of wood gas for the driving of motor cars, Dr. von Monroy said that one litre of gasoline could be easily and satisfactorily replaced by 2½ kilogrammes of wood. "I personally have come here," he continued, "and my friends, too, from Berlin, and the cost of the driving of the car amounted per person to not more than Marks 3.50 from Berlin to London.

Regarding wood as liquid fuel, the speaker said that, thanks to chemical research, they could actually produce 35 litres of alcohol from 100 kilogrammes of wood, and that alcohol was not bad for cars. Indeed, if one mixed it with normal gasoline it improved the latter and the car worked better. There were being worked out methods for producing gasolene out of wood, and this might be used not only for cars but also for aeroplanes.

There were lorries running in Germany on compressed wood gas, and with excellent results. Taking a long view, however, he thought this might not be of great importance for motor vehicles; if wood was used for that purpose he believed it would be in the form of wood and charcoal, and not in the form of compressed wood gas.

Referring to wood and the textile industry, Dr. von Monroy said that wood could now be used not only as a soft fibre, but as a hard fibre. From certain woods they could take out immediately the fibre and spin it. But the most important thing was the production of the staple fibre, of which Dr. Hägglund had been speaking, so that by this means they could replace wool by wood. Originally the "wool" derived from wood was less warm than natural wood. Now, however, it had been found possible to introduce air into the fibre and by this means produce a fibre which was entirely equivalent to wool.

Under the fourth heading, wood as foodstuff, the speaker declared that wood sugar and the crystallised glucose derived from it was in certain cases superior to ordinary sugar, especially for making jam and marmalade. With reference to wood as a chemical raw material, he mentioned the ability to get from wood an excellent resin.

By means of these modern utilisation possibilities the value of the forests could be increased. So far the interest yield had not exceeded 2½ per cent., which meant that from the capital investment point of view forests were not a first-rate business proposition. He believed the technical advances recorded must enable a yield of 3½ per cent. and even 4 per cent. to be given; under those conditions forests became a better business proposition. If they left out of account the danger of forest fires there was no safer investment than the forest, which through the ages maintained its value and did not depreciate; forest re-growing under sustained yield through ages and ages always maintained its value.

The Chemical Age Lawn Tennis Tournament

Plans for the 1936 Season

PLANS have been completed this week for the sixth annual CHEMICAL AGE Lawn Tennis Tournament, which will be conducted on similar lines to those which have proved so popular during the past five seasons. In previous years the arrangements have been made entirely by THE CHEMICAL AGE, but this year we are pleased to have the co-operation of a small committee representing the tennis players of the chemical industry, which held its first meeting at Bouverie House on Monday afternoon under the chairmanship of Mr. H. B. Crole-Rees, managing director of Benn Brothers, Ltd., proprietors of THE CHEMICAL AGE. It was agreed that the general arrangements should continue as before. There will therefore be a men's singles and a men's doubles competition, open to members of the chemical industry throughout Great Britain, either as principals or members of staffs.

Alteration in the Rules

The most important alteration in the rules of the tournament concerns the qualifications for the men's doubles. Instead of insistence that each pair shall be drawn from the same or an associated firm it will suffice if each player is in the chemical industry. Previous experience has shown that when a senior partner has retired from active participation in the game, the junior partner has sometimes been compelled to drop out of the tournament through being unable to find a new partner in the same firm. Under the new arrangement it is expected that a number of chemical friends will link themselves into tennis partnerships which will add a new and decidedly interesting touch to the men's doubles this year. At the same time, it is the feeling of the committee that the spirit of the old rule should be observed wherever possible in order that the friendly rivalry between different firms may be maintained.

The chemical industry numbers in its ranks many thousands of enthusiastic lawn tennis players, and we are looking forward to receiving a greatly increased number of entries this year, not only from London, but from the provinces also. For the convenience of provincial entrants all the early round draws will be so arranged that provincial players will meet each other as near home as possible in order to minimise the difficulties of travel.

THE CHEMICAL AGE silver challenge cups will be awarded to the winners of the singles and doubles, to be held jointly by the winners and the firms they represent for twelve months, while smaller trophies will be presented outright to each of the winners and runners-up. Already Mr. W. Lloyd Willey has promised to give statuettes for this purpose. The early rounds will be played in May, and the date of the finals has been provisionally fixed for September 12.

The doubles cup is at present held by F. G. Hawley and J. Haines, of the Anglo-Iranian Oil Co., who have won it for three years in succession and have generously given it back for competition in perpetuity. The singles cup is also held by J. Haines, who had a walk-over in the final last September owing to his opponent meeting with an accident a few days before the date fixed for the final.

Closing Date for Entries

The last day for receiving entries for the 1936 tournament is Monday, May 11, and intending competitors are urged to read the simple rules appended and to apply by telephone, post or in person for entry forms without delay to The Editor, THE CHEMICAL AGE, Bouverie House, Fleet Street, E.C.4.

The rules governing the tournament are printed below. As soon as possible after May 11 competitors will be notified as to the result of the draw and the final date for playing off the first round matches. The first player or players drawn usually suggest(s) immediately to his or their opponent(s) a convenient date and place for the match, and upon completion of the event the result, signed by all players (winners and losers), is posted by the winners in time to reach the offices of THE CHEMICAL AGE by the closing date which will be announced at the time of the draw. In the case of any dispute arising between players the decision of the Editor of THE CHEMICAL AGE, acting with the tournament committee, is taken as final. The Editor and the committee also have the right to scratch any players who do not play off their matches by the stipulated dates or who fail to conform to the rules of the tournament. There is no entrance fee, but it is understood that the players pay their own travelling expenses, etc.

Rules of the Tournament

1. Every competitor must be a member of the chemical industry, either as a principal or a member of a staff. There is no entrance fee of any kind.
2. Players in the Doubles need not necessarily be members of the same or associated firms, provided all players are members of the chemical industry as defined in Rule 1.
3. The Challenge Cups shall be competed for annually on courts of any surface in accordance with the Rules of Lawn Tennis and the Regulations of the Lawn Tennis Association. The winners of the Cups shall make arrangements for their safe custody and insurance.
4. The competition shall be conducted on the knock-out principle, and the best of three advantage sets shall be played in all matches, except in the finals when either the best of three or the best of five sets shall be played at the discretion of the Editor of THE CHEMICAL AGE and the members of the tournament committee present at the finals.
5. **Entries shall be made not later than May 11, 1936, on forms which may be obtained on application, to :**

"Lawn Tennis Tournament,"
"The Chemical Age,"
Bouverie House,
Fleet Street, London, E.C.

6. The draw shall be made on the first convenient day following the close of entries. The dates on or within which the several rounds must be played will be published in THE CHEMICAL AGE.
7. The Editor of THE CHEMICAL AGE, acting with the tournament committee, shall have the right to scratch any players who fail to play off their matches by the stipulated dates, or who otherwise fail to conform with the rules and regulations governing this competition.
8. Except in the case of the finals, players drawn against each other must make their own arrangements for playing off their match on a court mutually agreed upon. In the event of disagreement, the first name drawn shall have the right to choose the ground.
9. The result of each match must be sent by the winners to the Editor of THE CHEMICAL AGE, signed by all players (winners and losers), immediately after the match, and must reach the office of THE CHEMICAL AGE not later than by the first post on the day following the final day for playing off the round.
10. If any player be not present at the agreed place or time of the match, opponents shall be entitled to a walk-over, after having allowed reasonable time (say, a maximum of one hour) for the other's appearance. If the players find it impossible to play off their match on the day originally chosen, they must play it on any other day, to which both sides agree, within the stipulated period.
11. Any dispute arising between players, or otherwise, shall be referred to the arbitration of the Editor of THE CHEMICAL AGE, acting with the tournament committee, whose decision shall be final.
12. While competitors will decide as to hard or grass courts for the preliminary rounds, it must be understood that the Finals will be played on courts selected by the Editor of THE CHEMICAL AGE, acting with the tournament committee.

ALGERIAN phosphate exports declined during 1935 to 505,006 metric tons from 651,156 tons reported for 1934. France, the leading buyer, increased its purchases 1,300 to 154,541 tons. Notwithstanding decreased exports, the production in 1935 increased to 605,813 tons, as compared with 542,210 in 1934.

IT is anticipated that the 1936 Bulgarian crop of pyrethrum flowers will not exceed 100 metric tons. Most of this crop will be brought for local consumption, since the various restrictions on imports of manufactured goods have encouraged local firms to manufacture insecticides for the domestic market.

Society of Chemical Industry

Annual Meeting of the Manchester Section

THE annual meeting of the Manchester Section of the Society of Chemical Industry was held at the Engineers' Club, Manchester, on April 3, Mr. A. McCulloch, M.Sc., presiding.

The following officers and members of committee were elected: Chairman, Mr. A. McCulloch; vice-chairman, Professor I. M. Heilbron; hon. secretary and treasurer, Dr. W. H. Brindley; Plastics Group representative, Dr. W. J. S. Naunton; Food Group representative, Dr. T. K. Walker; committee, Miss Rona Robinson, Mr. D. M. Paul, Dr. R. H. Pickard, Dr. A. Schedler and Mr. N. Strafford in place of Messrs. W. Cowen, C. J. T. Cronshaw, F. D. Farrow, J. R. Hannay and Professor I. M. Heilbron, the retiring members. Dr. M. Barash and Dr. A. Geake were re-elected hon. auditors.

The Chairman referred to the great loss which the Section had suffered by the death of Mr. Howard Cheetham, the representative of the Chemical Engineering Group.

Dr. W. J. S. Naunton and Dr. T. K. Walker, the representatives of the Plastics Group and the Food Group respectively, presented reports of the activities of these groups during the current session.

Air Humidity in Industry

Reading a paper on "Air Humidity: its Measurement and Control in Industry," Mr. W. Cowen, M.Sc., said the drying of solids in conditioned air involves the evaporation of the moisture and the removal of the vapour in a stream of air. The ideal solution of any drying problem is that solution which, having a correct balance between the drying conditions of the process and the drying characteristics of the solid, leads to the lowest operating costs. One of the principal drying characteristics of the materials is the minimum dehydration period which can safely be used, and this depends on the mechanism by which the moisture is removed. The study of the drying of wet solids in air streams is facilitated by the use of the "psychrometric chart." The principles underlying the construction of this chart and its applications to specific problems were discussed.

"Recent developments in the chemistry of vitamin-D" was the subject of a paper by F. S. Spring, Ph.D. Irradiation of ergosterol with ultra-violet light results in a series of transformations represented by the scheme:—

Ergosterol → Lumisterol → Tachysterol → Calciferol → Suprasterols I and II, Toxisterol

The method by which the constitution of calciferol has been elucidated were recounted, together with a synopsis of the constitutional relationships of the various photoisomerides. Finally, mention was made of observed differences in the physiological activity of calciferol and natural vitamin-D respectively.

Colorimetric Determination of Mercury

"A colorimetric method for the determination of minute amounts of mercury in organic matter" was described by Mr. N. Strafford, M.Sc. This method was devised primarily for the determination of mercury in samples of seeds of grain, such as wheat and barley, which had been treated with a seed disinfectant containing an organic mercurial. The amount of mercury present was of the order of 40 parts per million. The reagent employed for the quantitative colorimetric determination of the mercury was *p*-dimethylaminobenzalrhodanine. The conditions under which this reagent can be applied to determine mercury were found to be much less critical than those required by diphenylcarbazide, since the colour produced is less susceptible to inhibition by interfering substances. Even so, traces of sulphate or halogen ions, organic matter, hydrogen peroxide, silver, cuprous copper, gold, platinum, and palladium interfere, and therefore a preliminary separation of the mercury from all such interfering substances must be carried out. It is to be noted that cupric copper does not interfere. The organic matter is destroyed by heating with sulphuric acid and perhydrol, the mercury precipitated with hydrogen sulphide in the presence of copper sulphide as a "carrier," and the resulting mixture of sulphides decomposed with halogen-free concentrated sulphuric and nitric acids.

Since the colorimetric determination cannot be carried out in a solution containing sulphate ions, the mercury and copper are separated from the sulphuric acid solution by electrolysis. The mercury is now dissolved in a carefully controlled amount of nitric acid such that after dilution to its final volume the concentration of the nitric acid in the test solution is N/20. The coloured mercury complex is produced as a colloidal dispersion, and there is a marked tendency for precipitation to occur on standing. For this reason the colour of the test and standard solutions must be compared at the same time, and as soon as the complex is fully formed. Experiments on seeds to which known amounts of mercury had been added showed that it is possible to attain from a hundredth of a milligram of mercury contained in five grams of seeds, as near to 100 per cent. recovery as can be judged by the colorimetric test finally applied. In other words, the experimental error is essentially that due to the final stage of the colorimetric determination, which is of the order of ± 7 per cent.

An Indian Government Laboratory

Permanent Position now Assured

THE question of establishing a permanent control laboratory at Delhi is now under urgent consideration by the Government of India, as such a laboratory has now become a necessity. The history of such chemical laboratorities in India, for Customs purposes, is interesting. Until 1912 the main commodity assessed to customs duty by chemical means was "spirituous liquors." These were tested in the Gauging Department of the Customs Houses, but any other imports requiring chemical analysis were sent to the chemical examiners of the local government of the presidency or province where the Customs House was situated.

As time went on, the number of articles requiring chemical examination for their correct assessment to customs duty increased, and the complexity of the issues became more involved. To deal with this, a laboratory was opened in the Calcutta Customs House, and a chemical examiner was appointed to examine customs samples and to carry out excise work. Many additions to the classes of goods assessable to duty under the Indian customs tariff on the basis of chemical examination took place during the next fourteen years, and in 1926 the Government of India decided to establish laboratories in the Customs Houses at the other major ports, so as to expedite the work. Laboratories have been suitably equipped for the purpose at these ports, and the apparatus at Calcutta has been augmented.

The Central Board of Revenue is now served by chemists who are under the administrative control of the Collector of Customs at their respective ports. All of the chemists are under the technical control of the special chemical advisor to the Central Board of Revenue. In Bombay useful work has been done in the determination of spirit strength in preparations containing isopropyl alcohol, which in India is liable to spirit duty. Calcutta has carried out tests on cocaine, as smuggling takes place principally at that port. The cocaine purification work was also carried on for some time, but was discontinued owing to unfavourable climatic conditions.

Imperial Institute Bulletin

An Appeal to a Wider Circle of Readers

COMMENCING with the January-March issue, the "Bulletin of the Imperial Institute" is being published direct from the Institute at South Kensington. The general format is unchanged, but the scope of the contents is extended to give a more complete reflection of the various aspects of the work. Whilst the Institute will continue to publish the results of the more important of its laboratory investigations, as well as articles and notes on plant and animal products, more space than hitherto will be devoted to subjects of mineral interest, including a bibliography of literature relating to economic minerals. Developments in the public exhibition galleries of the Institute will also be recorded. By this means it is hoped that the Bulletin will appeal to a wider circle of readers and with the same end in view the price has been reduced to 2s. 6d. per number, by post 2s. 9d. (annual subscription 10s. post free).

Work in Tanganyika

In this issue of the Bulletin an article by Mr. M. H. French, of the Tanganyika Veterinary Service, records the work which has been done in that territory to improve the quality of the clarified butter (ghee) produced there. This product, although little known in this country, is of great importance in tropical regions, since when properly prepared and stored it will keep almost indefinitely under conditions where ordinary butter turns rancid in a few days. The article should prove of great interest and value to the African colonies, India and other parts of the tropics where ghee is prepared.

Much attention having been drawn in the last few years to the gold discoveries in Kenya Colony, whilst relatively little has been said about the gold deposits of its neighbour Tanganyika, an article by Dr. E. O. Teale, mineral adviser to the Government of Tanganyika, describes recent developments in gold mining in that country. The recent discovery of workable coal within 25 miles of the western edge of this gold field offers the prospect of a valuable source of power. The total gold production of the territory has grown steadily from 1,325 oz. in 1923 to 54,702 oz. in 1934, whilst new large-scale operations will, it is expected, augment the output very materially in the near future.

Another article gives a brief outline of the mineral resources of Johore, one of the little-known Unfederated States of Malaya. Here alluvial tin ore is being mined in three different areas. In another area iron-ore is being mined, and unworked deposits are known to occur in three further regions. Gold and china clay are being produced in small amounts, whilst wolfram has been found in one locality and prospecting for coal is being carried on in two places.

Coalfield under Thames Mouth

Subjects dealt with in the "Notes" section include, among many others, the cultivation of lemongrass and the distillation of its oil; evidence for a concealed coalfield under the Thames mouth; developments in the production of petroleum and natural gas in Alberta; the efforts which are being made to prepare alumina from clay and other silicates; the use of magnesite-talc rock from the Sudan as a refractory and the development of forsterite-periclase bricks; a summary of the results of the Water Pollution Research Board's work on base-exchange water softeners; and the coloration of glass by mineral compounds.

Whilst appreciating the improved plan of publication, with its possible extended interest to a much wider circle of readers, it is much to be regretted that the "Bulletin" continues to be provided with a cover of red paper which seems to be dyed with the very worst dye that the Empire could produce. On a hot summer day it is quite impossible to carry a copy of the "Bulletin" unprotected in the hand for any length of time without getting the hand stained with the same red colour as the cover; on a wet day the cover quickly acquires a mottled appearance as each drop of rain removes its share of the red dye. Present readers of the "Bulletin" may have tolerated this inconvenience without complaint for many years, but reaching a new circle of readers something will have to be done to make the cover more satisfactory.

Professional Organisations

Their Value to Society

IN an address delivered before the British Association of Chemists at Accrington on March 13, Mr. R. Brightman, M.Sc., F.I.C., gave an able exposition of the value of professional organisations to society.

Mr. Brightman said that the chemist had realised the impossibility of isolation. Apart from the technical considerations of interdependence with other professions there was the wider aspect of service by the professions to the community in general. One of the fundamental characteristics of the professional outlook was its emphasis on service, and this could best be fostered by professional organisations. The scientist was concerned with the search for truth, and the results of this search might sometimes conceivably be such that strong opposition to the pursual of the work would be aroused. For example, new theories might be developed from work now in hand, which may give evidence of biological grounds for Socialism. It was conceivable that it would not be to the interest of some of the bodies upon which fundamental research often depends for its resources to allow the fruition of such work. The danger was not of direct interference with scientific researches, but of discouragement by the withdrawal of support. A strong professional organisation was needed to ensure that no scientific study should fail from this cause.

Scientific workers were independent. This was to be seen in the way in which professional institutions had acquired an international life. They practised each within its own nation, but their loyalties could not be confined within national frontiers. One of the most significant examples of this tendency was to be seen in the way in which medical work throughout the world was being co-ordinated under the International Health Organisation of the League of Nations. The standard of health administration and practice was being raised all over the world, and a really impressive demonstration had been given of the capacity of the scientific expert for co-operation and administrative work. With regard to the individualistic benefits of organisation, it was only under the stimulus and inspiration of an active professional organisation powerful enough to afford adequate defence against victimisation, wise enough to restrain immature or premature policies, that the individual would feel himself able to play his part in moulding organisation and machinery, whether in industry

or in society. The contribution of the professional man would largely be rendered through his individual position in industry or society, and its efficacy demanded professional loyalty and support.

Industrial safety could be promoted by the employment of qualified supervision, backed by the power to make recommendations and see that they were acted upon. Further, it was at least open to discussion whether, when a firm declined to accept the protection of the patent law and operated a secret process, the liability to disclose the full details in the event of any accident or loss of health or life should not be one of the penalties incurred. It was inconsistent with the idea of a profession to permit the concealment of information which might have a vital bearing on health and safety in other quarters of industry. This question was not outside the legitimate sphere of work of professional organisations.

Labour problems were also in the scope of activity of professional organisations. A number of departments were already dealing with special phases of industrial management or administration, but the human and social factors would receive adequate attention only under the influence of the professional spirit. The report on the working of the five-day week at the factory of Boots Pure Drug Co., afforded an admirable example of what might be done. The report described an attempt to arrive at definite conclusions on an important matter from actual experimental facts, and the evidence was presented in a detailed way which made it possible to determine with little difficulty how far a similar experiment was likely to be successful elsewhere.

Speaking of the possible dangers of organisation, Mr. Brightman said that there was a tendency for associations to become static and mentally non-receptive. Working too closely to schedule caused them to run in grooves. He concluded with an appeal to chemists to carry their knowledge of scientific method into everyday life, and not to leave it in the laboratory. They failed lamentably in the larger sphere to display the same standards of exactitude and judgment as they applied in their immediate occupation. If they would but see and use their opportunities they might make an amazing contribution to industrial as well as social leadership.

The Conditioning of Boiler Water

A Review of Recent Developments

THE objects of recent developments in the technique of boiler water conditioning, said Mr. C. W. Tod in a paper on "Boiler Water Conditioning" at a recent joint meeting of the Birmingham Section and Chemical Engineering Group of the Society of Chemical Industry, were to protect the heating surfaces from scaling and corrosion, the maintenance of free circulation in the boiler and the prevention of foaming. As boiler water became concentrated, the less soluble salts were precipitated as scale if they were sulphate, silicate or hydroxide of calcium, or as sludges if they were present as carbonate or phosphate. Sludges, unlike scales, had no serious drawbacks when under control. Oxygen in the feed water was the cause of the most dangerous form of boiler corrosion, but could be prevented by the efficient deaeration of the feed water, or chemically, by the addition of sodium sulphite.

For protection against caustic embrittlement, the practice was to maintain a definite ratio of sulphate to alkalinity in the boiler by the addition of the necessary constituent into the feed lines. Priming could be largely minimised by the careful design of the boiler itself, but the presence of organic matter and other factors also assisted in this respect. In this country, the most widely used plant for the preliminary treatment of boiler water to prevent scale formation was the continuous lime-soda process, and coagulants, such as sodium aluminate, were often added to assist in the removal of magnesia hardness. Variants of the process included the caustic soda process, the lime-barium carbonate process and the use of blow-down in the softener.

Preliminary Treatment

The base-exchange water conditioning process was not often used alone, as it produced excessive alkalinities where the raw water was high in bicarbonates, but generally in conjunction with the lime-soda process as a preliminary treatment. When the percentage of make-up water was low, as in modern power stations or on ships, evaporation might be used to produce the water supply, exhaust steam supplying the heat required.

Assuming that a supply of well-softened raw water of suitable alkalinity had been obtained, it was necessary to consider the reactions which occurred in the boiler. Since all the calcium and magnesium had not been removed, there was still a possibility of scale formation accentuated by the presence of sulphate added to inhibit caustic embrittlement. It was therefore necessary to adopt some form of boiler water conditioning to convert the insoluble materials into non-adherent sludges. The use of colloids and electrical treatment had been suggested and tried, but the most certain method of conditioning was to add suitable negative ions, such as carbonate or phosphate, whose calcium salts did not form scale under the conditions in the boiler. The theoretical basis of this method was due to the pioneering work of Dr. R. E. Hall. Owing to the decomposition of sodium carbonate at high boiler pressures, carbonate conditioning was usually replaced by phosphate conditioning, because phosphates were stable under all boiler conditions and helped to prevent silicate scaling. In practice, five parts in 100,000 of a phosphatic compound PO_4 ensured the absence of scale, a sludge of calcium phosphate taking its place. The choice of phosphate was governed, on technical grounds, by the production of a suitable boiler alkalinity, and the method of feeding to be adopted. If orthophosphates, such as di- or tri-sodium phosphate, were introduced into boiler feed water which contained calcium salts, an immediate precipitate was produced, leading to deposition in the food lines; the difficulty might be overcome by the use of colloids, but the real solution was to pump orthophosphates directly into the boilers.

With metaphosphates and pyrophosphates, on the other hand, no immediate precipitate was formed in water of low hardness, as it was not until hydrolysis of these other phosphates occurred in the boiler that insoluble calcium phosphate could be formed. Metaphosphates could also, by their virtue of forming complex ions with calcium, when added intermittently to the feed lines, dissolve up deposits already there. Internal treatment, by which the whole of the hardness in the raw water was precipitated in the boiler, although successful in some cases, should not be regarded in any way as a satisfactory substitute for carefully regulated pre-treatment and conditioning.

THE use of acetone in Mexico increased considerably between 1930 and 1934, but imports in 1935 only slightly exceeded those of the preceding year. The United States is the principal supplier of this product and furnished about one half of the market. Total imports in 1934 amounted to 32,465 pesos, and during the first ten months of 1935, 29,235 pesos, of which the United States received 15,844 pesos, Sweden 10,992 pesos, Germany 2,135 pesos, and Great Britain 218 pesos. Very little acetone is manufactured in Mexico.

The British Drug Houses, Ltd.

Progress in Medical Products

PRESIDING at the annual meeting of the British Drug Houses, Ltd., on Tuesday, Mr. Charles A. Hill (chairman and managing director) said that the results of trading had again proved satisfactory, a moderate increase in profit being produced. In the home market during the past year the demand for and sale of B.D.H. specialities had continued and had resulted in an increased turnover. In the export section, also, turnover had increased, in face of many conditions which hampered trading. Their policy of introducing new medical products when the need for these had been clinically demonstrated had brought them a measure of reward during the past 12 months. He referred in particular to the recent introduction of Anahaemin, the highly active liver preparation discovered by Dr. H. D. Dakin aind Dr. West—an event in the history of B.D.H. medical products.

As a result of the introduction of Anahaemin the medical profession was now given the means of effectively treating pernicious anæmia by only occasional administration—and at wide intervals—of that new drug. The new treatment was more effective than that which necessitated the irksome daily intake of liver itself or of liver extracts. To quote the recently published report of the Medical Research Council: "To anyone mindful of the almost certain death that followed the development of pernicious anæmia, even so recently as 10 years ago, the recovery that follows these minute injections of anti-anæmic principle seems litte short of miraculous." It was a source of gratification to those who had been working on the subject for many years to have been associated with Dr. Dakin with that discovery.

The problem of securing proper nutrition in all classes of society was in no small measure dependent upon supplementing the available diet with the vitamins in proper and adequate amount. In particular, shortage of vitamins A, C and D during adolescence had a direct bearing upon the defects which appeared in later life, and that had been clearly demonstrated in the researches relating to the healthy development of teeth. During the past year their scientific staff had made such progress in that field of biochemical manufacture that they had been enabled, as the result of much intensive work, to produce, in the convenient, portable, and palatable form of chocolate-coated pellets, a new vitamin preparation—marketed under the name of "Multivite"—which contained the four essential vitamins A, B, C and D in definite standardised amounts.

Boring for Oil in Hampshire

THE first test well to be sunk in England under the provisions of the Petroleum Act, 1934, was begun last week on Portsdown Hill, above Portsmouth Harbour, where a site of five acres has been secured by a subsidiary of the Anglo-Iranian Oil Co. The machinery was set in motion by Mrs. Crookshank, mother of the Secretary for Mines. She has associations with Titusville, Pennsylvania, where the first artesian oil well in America was drilled by Colonel E. L. Drake in 1859.

This effort to find oil in England is being made by the D'Arcy Exploration Co., which has installed oil-drilling plant of British manufacture and of the most modern type. The plant is capable of drilling to a depth of nearly three miles. The bore hole has a diameter at the top of 23 in., which gradually decreases as the depth increases. From a derrick 135 ft. high, with a loading capacity of 400 tons, a rotary drill is operated. Above this drill is a travelling block weighing 3½ tons and a travelling hook weighing two tons, while the rotary swivel weighs two tons. Three steam-driven pumps extract the mud from the bore. Power for the plant is supplied by four boilers with a steaming capacity of over 14,000 lb. per hour at a pressure of 250 lb. per sq. in. The work of drilling the well may take two years and cost any sum up to £60,000.

Mrs. Crookshank, mother of the Secretary for Mines, starting the drill at the oil well at Paulsgrove, on the Portsdown Hills outside Portsmouth.

Speaking at the inaugural ceremony, Captain Crookshank, Secretary for Mines, said that other applications for licences had been made and as soon as the conditions laid down in the Act and Regulations had been complied with, other licences would be issued. The conditions laid down were such that it would be difficult for anyone to obtain a licence who could not produce reasonable evidence of willingness and ability to carry out work in a satisfactory manner. He was very glad to see this new enterprise launched into the stage of practical endeavour, and wished it every success. It was gratifying to the Government and to the Department to know that the legislation which had been established was recognised by the industry here as sound and reasonable, and that that view was supported in several other countries where reference had been made to it. While the Government had sufficient evidence of renewed interest to justify it in putting forward new legislation, it could be said that when the Bill was introduced there was no indication that investigations on a scale such as were now likely to be undertaken would result. Those who were privileged to see the preparations which had been made for the initial borehole could have no doubt of the seriousness with which this matter was being treated by the Anglo-Iranian Oil Co.

Red Stains on Gas Globes

Their Cause and Prevention Investigated

THE development of a reddish stain on heat-resisting gas globes used with high-pressure gas has been noticed from time to time. The origin of this colour has now been cleared up as a result of investigations carried out in the research laboratories of Chance Brothers and Co., Ltd. Chemical analysis showed in all cases that the colour was due to the presence of reduced copper. Since the stain was not removable by hydrochloric acid, but could be dissolved away by hydrofluoric acid, it follows that the stain had been burnt in at a temperature above the softening point of the glass.

It has been found possible to reproduce the mark by various methods, such as by the evaporation of a dilute solution of copper sulphate to dryness on the globe, with subsequent strong heating with a flame. It was also found possible to develop it by allowing a bunsen burner with a brass stem to "burn back" and the green-coloured flame so obtained to be directed on the globe; after a few hours heating a pink stain was produced which was identical with the marking on the globes that had been returned for inspection.

Since there is no copper in the original glass, it is clear that this stain comes from the fittings, either due to corrosion and subsequent solution of the products of corrosion by condensed moisture which runs down on to the globe and evaporates there, or by the impact of a flame containing volatile copper compounds due to incomplete combustion in the first place. The fact that it is possible to heat the glass so that its surface gets above the softening point, and to do this without fracture, confirms the very high heat-resisting qualities which are obtainable with gas globes at the present time.

Society of Public Analysts

Election of New Members

AN ordinary meeting of the Society of Public Analysts was held in the Chemical Society's Rooms, Burlington House, on April 1, the president, Dr. G. Roche Lynch, being in the chair.

Certificates were read in favour of Willem J. P. Pelle, George H. Walker, Herbert W. Watson, and Harold F. P. Webber. The following were elected members of the society: Lewis G. S. Hebbs, William C. Johnson and James Young.

The sulphuric acid test for liquid paraffin was the subject of a paper by Mr. C. E. Sage, F.I.C., and Mr. S. G. E. Stevens, B.Sc., A.I.C. To ascertain the significance of the acid test, experiments were made with sulphuric acid of different strengths, and the conclusion was drawn that the most satisfactory results are obtained by the use of 97 per cent. acid. A standard technique for the test with that strength of acid has been devised, and it is stipulated that after 10 minutes in the boiling water bath the colour of the acid layer must not exceed 10 yellow and 4 red Lovibond units.

Moisture Content by Distillation

Discussing the determination of moisture-content by distillation with liquids immiscible with water, Dr. L. A. Warren, Ph.D., B.Sc., A.I.C., said an improved form of the Dean and Stark apparatus has been devised, whereby an accuracy of 99.5 per cent. on a distilled volume of 2 ml. of water is obtainable. The method is capable of detecting the formation of lower hydrates during dehydration, and is shown to afford evidence of the existence of magnesium sulphate trihydrate. The apparatus enables water to be determined accurately in materials not easily examined by oven-drying methods.

A modified form of apparatus for the determination of water and essential oil by the distillation method was described and demonstrated by I. C. P. Smith, B.Sc. It eliminates many of the drawbacks of previous forms of apparatus.

The mydriatic effect of cocaine and its differentiation from the atrophine group of alkaloids was the subject of a paper by K. R. Ganguly, M.Sc. The experiments described show that a solution of cocaine hydrochloride containing the equivalent of less than 0.025 per cent. of cocaine base has no effect upon the eye of the cat, whereas atrophine produces dilatation to a dilution of 1 : 300,000.

Bauxite Prospects in India

A Growing Aluminium Industry

THOUGH bauxite has been known to exist in India in large quantities, it has never been exploited adequately for industrial purposes and its only use was found by oil companies for the purification of kerosene and by chemical companies for the preparation of aluminous sulphates on a small scale. Experiments have been in progress for the manufacture of bauxite refractories for furnaces in Bengal and for preparing abrasive products such as grinding wheels. Research in the preparation of calcium aluminate cement has also been successful on a laboratory scale.

As the demand in India for these products is rising, the Indian bauxite will find greater use in the preparation of refractories, abrasives and cements. At one time it was hoped that calcined bauxite could be exported, but, owing to the high cost of transport, that has not seemed possible. The chief use of bauxite lies in the manufacture of aluminium, but owing to the absence of cryolite nothing on an appreciable scale could be attempted. But cryolite has now been discovered in India and is available in sufficient quantities, and as a result an Indian aluminium industry is likely to grow in future. Already a beginning has been made by the Kolhapur State where large bauxite deposits exist.

Diesel Oil from Coal

Experimental Plant produces Satisfactory Fuel

THE results of producing Diesel oil from British coal were disclosed by Colonel Whiston A. Bristow, chairman of the Low Temperature Coal Distillers' Association of Great Britain, in a paper read to the Institution of Petroleum Technologists at the Royal Society of Arts on Monday. "An experimental plant," he said, "was installed nearly a year ago, with two variable compression Diesel engines, and all the plant necessary for the preparation of the Diesel fractions, and considerable running has been carried out, including 100 hours' runs similar to those required for aviation engines." The question of bringing down the spontaneous ignition temperature without lowering the flash point had proved extremely difficult, but the problem had now been solved, and it was confidently expected that there would be no more trouble on this account.

After extensive bench tests the oil had been tried on a 32-seater coach on the regular daily passenger service between London and Bournemouth, and the coach had performed the return journey without incident. One driver took the coach down in the schedule time of five hours, and No. 2 driver left Bournemouth at 2.40 and reached King's Cross at 7.30. No. 1 driver expressed the opinion that the fuel gave plenty of power and that at speeds above 30 m.p.h. the engine ran as well as with the normal petroleum fuel, but that at speeds below 30 m.p.h. he was inclined to think that it was perhaps a little more noisy. No. 2 driver could not notice any difference from his normal fuel, except that the exhaust at some speeds was perhaps a little more pronounced and lighter in colour. The total distance covered was 225 miles, and the fuel consumed 23¼ gal., which gives 9.7 miles per gal. The same engine, on its runs prior to the test, was running at about 11 miles per gal. The fuel injection valves, on being withdrawn, were found to be quite clean.

Other running tests had been since carried out with equally satisfactory results, and the oil was still being improved. It was estimated that about one-third of the total crude would be available as Diesel oil.

Industrial Biochemistry in Northern Ireland

A Plea for Specialised Attention

IN a lecture given to the Belfast Section of the Institute of Chemistry held in the Physics Lecture Theatre of the Royal Belfast Academical Institution, on March 19, Dr. W. H. Gibson, director of research, Linen Industry Research Association, discussed the place which industrial biochemistry should take in the life of the province. The lecturer traced the development of the science of chemistry up to its present vast dimensions. Once the first principles were established some 150 years ago, growth was amazingly rapid and specialisation, with the subdivision of the science into sections, became imperative, since no single mind could keep abreast of advances over the whole field. One of the earliest divisions was into inorganic and organic chemistry, and the latter was originally intended to be the chemistry of the compounds associated with living things, so it was the precursor of modern biochemistry.

Although the title of organic chemistry has been retained, this branch is now concerned with the chemistry of all the compounds containing carbon, and the relation of this study to biology is only very casual. The idea of pure chemistry as opposed to applied chemistry then grew up and we reached a classification of pure chemistry into general chemistry, physical chemistry, inorganic chemistry, organic chemistry, and so on, each branch being studied as a part of the whole system or framework of chemistry. The relation of chemical phenomena to life and in particular to the social life of man is thus extraneous to the main lines of the subject, when studied as pure chemistry.

Even in pure chemistry alone, the active pursuit of knowledge has, in the course of time, produced a stupendous volume of information, with the result that man can do more than specialise in a limited field and have a smattering of knowledge of the remaining branches. Of recent years there have been remarkable developments in the study of those chemical substances associated with life, and it has been found necessary for men to specialise as biochemists and to form the separate section of the science which we now call "biochemistry." On the applied chemistry side there has also been ever-increasing specialisation, and at the present day there are 26 divisions of applied chemistry recognised in the annual reports of the Society of Chemical Industry. Almost half of these are biochemical subjects, such as the chemistry of rubber, leather and glue, or foodstuffs.

There has, however, been little or no linkage of the development of pure biochemistry with applied or industrial biochemistry. In this respect, Northern Ireland is no better than any other part of the country, but in the view of the lecturer, a thorough reorganisation of chemical training and the application of properly trained men to the biochemical industries of the province is essential if we are to lead and not follow in the wake of progress made elsewhere.

It was pointed out that the industrial resources of Northern Ireland in the way of raw material are very largely agricultural, *i.e.*, biochemical products, and so in the study of chemistry in the province from a vocational point of view, special attention should be paid to biochemistry and in particular to those products produced on the farms of the province. The lecturer then went into detail in regard to the biochemistry of some of the more important products of the province, such as foodstuffs, flax, etc.

Society of Glass Technology

General Discussion on Photography of Glassware

THE meeting of the Society of Glass Technology held at Stourbridge on March 18, was devoted to a general discussion on the photography of glassware. The president, Mr. B. P. Dudding, was in the chair. Four papers were presented.

Mr. C. WORMALD in a paper on "Some Considerations in Photographing Glass for Commercial and other Purposes," indicated the lines of action to be taken when attempting to produce a satisfactory photograph. First it was necessary to know the exact desires of the client, and what purpose the photograph was to serve, as this had a strong bearing on the methods to be employed. The various methods used for obtaining the best results for purposes such as newspaper illustration, sales catalogues, or high-class booklets, were outlined and contrasted. The speaker described various artifices, such as spraying, or cutting in two, employed to overcome the trouble due to the transparency of glass, and the great number of reflections in it. He also advised keeping abreast of fashion in photography, outlining present-day tendencies, with special reference to the relative merits of dark and light backgrounds, and to the various practices of re-touching negatives and blocks.

Mr. J. L. HOUGHTON (Kodak Research Laboratory), in a paper on "The Photographic Application of the Pola Screen," explained the differences between two Eastman Pola Screens and a Wratten neutral filter, all of which looked alike. The filter merely cut down the intensity of light passing through it, while the screen polarised the light. The behaviour of a strained piece of glass placed in the path of a beam of polarised light was illustrated by means of a Rupert's drop. The nature of polarised light was explained, and by means of an interesting model the actions of a polariser and an analyser were demonstrated. By means of lantern slides the lecturer showed how valuable the screens were in connection with the photography of glassware, one example being the elimination of reflections from shop windows. Another instance cited was the control of high lights from a glass object, which was illuminated by polarised light, then photographed with a screen in front of the lens in a position between "crossed and parallel." Cases in which the effects of the screens were unique were described, and the speaker concluded by giving a few practical details concerning the light transmission and heat resistance of these fresh aids to the photography of glassware in particular.

Mr. A. E. J. VICKERS and Mr. D. P. LEWIS (Imperial Chemical Industries, Ltd.), presented some "Notes on the Photography of Specific Pieces of Glassware," and detailed the technical difficulties of photographing glassware. The characteristic curve showing the relationship between density of the silver image and the time of exposure for a particular plate was explained by a diagram and discussed. Various pieces of glassware which the authors had photographed were shown, with lantern slides giving the happiest results obtained in numerous experiments. The successes and weaknesses were indicated. One pair of photographs well illustrated the effect of different lighting and general conditions.

Miss F. M. ANTHONY, B.Sc., and Miss G. B. GINSBERG (research laboratories of the General Electric Co., Ltd.) presented a paper on "The Photography of a Cut Glass Article—the Effect of Lighting."

Some Remarks on the Fastness of Cotton Dyestuffs

A Study of the Five Main Groups

READING a paper on the fastness of cotton dyestuffs before a meeting of the Manchester Section of the Society of Dyers and Colourists on March 27, Dr. Schwen differentiated between the five main groups of cotton dyestuffs made from coal tar, namely: Basic dyestuffs, direct dyestuffs, sulphur dyestuffs, naphthol dyestuffs, and vat dyestuffs. As regards the fastness to light of these groups, it might be said that in each case, with the exception of the basic dyestuffs, there were to be found fast as well as relatively loose members, although, generally speaking, the fastness to light increased proceeding from the basic to the vat dyestuffs. It was impossible, however, to bring all the experience gained of synthetic dyestuffs under a general rule. Some of the direct dyestuffs were much faster to light than certain members of the vat dyestuffs, as, for instance, indigo. Within the individual groups certain rules could be observed. It was known, for instance, that vat dyestuffs produced from anthraquinone were, generally speaking, more unaffected by light than those made from indigo or thio-indigo. Furthermore, it was known that within the naphthol group the naphthols made from a nauhthalid of the β-oxynaphthoic acid were faster to light than those made from the β-naphthalid.

Differences in Constitution

Dr. Schwen then referred to the constitution of a representative of a direct dyestuff, a vat dyestuff, and a naphthol dyestuff. He explained that the main difference between Benzo Purpurine 4B, on the one hand, and Idanthreee Blue RS and the naphthol combination, as fixed on the fibre, was that the Benzo Purpurine 4B contained sulphonic groups, namely, SO_3Na groups while the others did not contain any sulphonic group. All direct cotton dyestuffs having one or more sulphonic groups were more or less affected by water and washing unless suitable methods were adopted to prevent it. It seemed to be clear that vat and naphthol dyestuffs must be stable to water and washing because of the complete absence of sulphonic groups.

Continuing, Dr. Schwen stated that he did not intend to discuss details of levelling because this had nothing to do with fastness, though levelling was nearly the same thing as penetration, and penetration did affect the fastness. Supposing it was necessary to dye a very tightly woven cotton piece with a vat dyestuff possessing high affinity, the surface of the material only would be dyed, while the middle of the threads, especially the crossings, would remain more or less undyed. It was obvious that the thin film of dyestuff would be destroyed very easily by the light rays, or by washing liquors, and especially by brushing, and that the undyed white fibre would show up. It was necessary, therefore, to search for possibilities of obtaining better penetration, especially for vat dyestuffs, which caused the greatest difficulty.

Obtaining Good Penetration

There were two ways of obtaining good penetration. In the first place there was the pigment-padding process, according to which an insoluble dyestuff in conjunction with a product was used which helped to bring the dyestuff into the fibre, like Prestabit Oil V, Eulysine A, etc., subsequently adding caustic soda and hydrosulphite. The dyestuff was reduced and fixed on all parts of the fibre, *i.e.*, on the surface as well as in the middle of the fibre. Suitable padding machines were necessary. Some dyers, however, preferred to dye in the ordinary way, adding a product like Peregal O which penetrated well, and worked in such a way that it decreased the affinity of the dyestuff for the fibre so that the dyestuff had time to get inside the fibre.

As to the naphthol combination, the after-treatment of naphthol dyeings at the boiling point had a very great influence, not only on the fastness to rubbing, but, more so, on the fastness to light. Having regard to the work of Ruperti on cotton material, and his, the speaker's, own work on cellophane, a film made from cellulose according to the viscose process, it was known that the coupling of the diazo and the naphthol compound was effected in a very high colloidal state. It appeared to be evident that in this condition the fastness to light could not be very high, because the fine particles were easily destroyed by the light rays. By boiling the dyed material in a soap bath, or by treating it with steam, aggregations of very large particles were obtained, which were, of course, more stable against the influence of light. It might be of interest to note that the process of aggregation could operate conversely, by treating the soaped dyeings with heat of a very high temperature, namely, about 250° C. through ironing.

Fastness to Rubbing

Several methods had been suggested for improving the fastness to rubbing of naphthol combinations. In the first place, increased fastness to rubbing could be obtained by using a naphthol with a high affinity, and rinsing after impregnating with a solution of common salt and caustic soda to remove the unfixed naphthol. Secondly, the unfixed lake could be removed by an after-treatment with a large amount of soap, *i.e.*, about 10 grams per litre, or by a mechanical after-treatment in washing machines. A third possibility was suggested by the following consideration. While the coupling inside the fibre was done in a colloidal state, the part coupled on the surface of the fibre produced precipitations which were responsible for the bad fastness to rubbing. A product was therefore sought for which possessed a high protective action which allowed for the coupling outside of, or on, the surface of the fibre in a colloidal state. Diazopon A was very useful for increasing fastness to rubbing.

Since it was possible to increase the fastness of fast dyestuffs, it must be possible to a still higher degree with loose dyestuffs. The fastness to light of basic dyestuffs could be improved by treating them with Auxanine B, which was an inorganic product, and which gave a chemical compound of high molecular weight with the basic dyestuffs. The improvement was also effective and made use of in the manufacture of high-grade colour lakes for wallpaper, printing inks, and numerous other applications. These dyestuffs, such as the Fanal dyestuffs, were produced in the factory by treating basic colours with a product of a similar nature to Auxanine B.

Treatment with Developers

Members were reminded of the diazo dyestuffs obtained when diazotising the NH_2 group of certain dyestuffs, and treating the diazo compound with the well-known developers. This method improved the fastness to water and washing to a certain extent, as the influence of the sulphonic group was diminished. A similar effect was obtained when the dyed material was treated with copper sulphate and bichromate or formaldehyde or diazo compounds like diazotised paranitraniline. It was now possible to diminish the influence of the sulphonic groups by removing the Na of the SO_3Na group by products of a high molecular weight, like Solidogen B, Fixanol, etc. The reason for this improvement was due to the fact that the dyestuffs treated with Solidogen B, or a similar product, became insoluble in water so that they could not bleed. Another method of improving fastness to water was to treat the dyed or printed material with a waterproofing agent such as Ramasit K conc. The fibre became water-repellent, so that dyeings or prints could not be affected by water.

Long Service Presentations

Prosperity at the Castner Kellner Works

PRESENTATIONS of gold and silver watches and gold medals, in recognition of long service at the Castner Kellner works, were made at a dinner in the staff dining hall at Weston Point on April 1. Mr. J. Rogers, a director of Imperial Chemical Industries, Ltd., made the presentations to nearly fifty members of the staff and workmen.

Mr. Rogers, after distributing the awards, said it was quite evident that Imperial Chemical Industries were getting their share of the general prosperity being experienced by the country. Recently, nothing of outstanding interest had occurred in the conduct of their concern, but, curiously enough, it was only when things were not going too well that exciting things happened. The company was bound to play a considerable part in the Government's defence scheme. The Government was taking steps to get the utmost help it could by friendly means with industry. It was obvious that industrialists would play their part, and reliance could be placed on the statement that there would not be any profiteering.

Mr. F. W. Bain, chairman of the General Chemical Group, expressed thanks to Mr. Rogers and said that in him the General Chemical Group had a real friend.

The recipients were as follows:—Gold medal for 40 years' service: G. H. Blades and G. H. Darlington. Gold watch for 35 years' service: W. G. Atherton, J. Brown, D. Catherall, T. Clare, C. F. Duncan, W. Helsby, J. H. Hulse, G. A. Mack, T. Poole, F. W. Riley, W. Reynolds, T. Spender, R. Thornton and F. Whitlow. Silver watch for 25 years' service: J. T. Barker, C. H. Barnett, T. T. Bates, W. Bradbury, F. Brown, H. Buckley, E. Carter, H. Cartledge, J. Clare, S. R. Davies, J. Dean, T. Findlow, J. T. Harrison, T. Haslam, O. Hatton, T. Hazlehurst, D. Hazlehurst, G. Hignett, W. Holloway, F. J. Hough, W. S. Hussey, W. Kein, F. Lightfoot, W. Noden, W. Palin, J. H. Roberts, W. Siddall, W. Tudor and W. Whitby.

British Association of Chemists

Annual Meeting of Liverpool Section

THE annual meeting of the Liverpool Section of the British Association of Chemists was held at the Exchange Hotel, Liverpool, on April 2, Mr. L. Wild being in the chair. The meeting was attended by the president, Professor E. C. C. Baly, and the general secretary, Mr. C. B. Woodley.

The report of the committee for the year to March 31 showed the membership to be 191, consisting of 164 full members, 21 probationary members, 3 student members and 3 honorary student members—a net increase of eleven members. Delegates from the section had attended every meeting of the Council, and an interesting feature of the sectional events was the holding of the annual meeting of the association in Liverpool last November. The series of meetings at Widnes had been continued during the session. Some discussion had taken place during the session in regard to the Pharmacy and Poisons Act, and this matter had now been left in the hands of the head office.

The following officers were elected for the ensuing session: Chairman, Mr. G. C. Riley; vice-chairman, Mr. C. A. Wiley; hon. secretary, Mr. E. Myer; hon. treasurer, Dr. F. W. Kay; committee, Messrs. H. P. Minton, W. S. Reid, M. Rosebery, A. Betton, D. T. Bruce, T. L. Looker, W. Mansbridge, R. J. Taylor, J. Sowler, D. G. Barkla, E. P. McManus, J. W. Crabtree, G. C. Corbett, T. E. Fore and L. Wild.

Professor Baly, in the course of a short address, gave a résumé of the present position of the association in regard to the Pharmacy and Poisons Act. Dealing with the recommendations of the Beveridge Committee in regard to raising the compulsory insurance level up to £400 a year, he said he thought this might be of enormous importance to them in attracting more members, when they compared what the Association offered them with what the Government offered. He thought they were within sight of attaining 75 per cent. at least of the original ideals of the founders of the Association, and the future appeared far brighter than it had ever been. Professor Baly concluded by paying high tribute to the work of Mr. C. B. Woodley, the general secretary.

A general outline of the work of the Association, mainly in reference to the employment bureau, formed the theme of an address by Mr. Woodley, who made a special plea for members to assist the bureau as far as possible by notifying them of vacancies occurring, or any changes which might affect the employment situation. He instanced cases where the Association had been of assistance to members, and concluded with some sound advice to members in regard to appointments, processes and agreements.

Steel Industry Activity

Firth and Brown's Increased Profits

PRESIDING at the annual meeting of Thomas Firth and John Brown, Ltd., at Sheffield last week, Lord Aberconway announced that the profits of the company for the year under review were substantially larger than they were in the previous year. The directors, however, recommended a dividend of only 12½ per cent. as they thought it was desirable that £100,000 should be placed to general reserve. Large capital expenditure was being employed to remove bottle-necks in the company's production, so as to meet the present heavy demands on its manufacturing resources. A large part was being spent in an effort to be in the very front rank in all methods of production.

The costly ingredients of most of their alloy steels, the careful heat treatment in all stages of their manufacture, the constant testing and inspection, the need for accuracy in mechanical finish, all must involve heavy manufacturing expenditure, but wastage of labour and of fuel and an undue production of scrap did not take place. The latest labour and fuel-saving devices were being installed, as well as the most modern plant to help towards metallurgical and mechanical perfection in their products. The best insurance against bad times was for their products to be outstanding in their excellence, and for them to be able to make them cheaply, or, if possible, more cheaply than could their competitors for the same class of products, whether at home or abroad.

The company's output included certain products which must be classed as armaments—namely, armour plate, naval shell and torpedo air vessels. These products had never represented more than a small proportion of their total turnover, and for the year 1935 amounted in value to less than 16 per cent. of their total deliveries. At the beginning of March the total of orders on their books stood at a very satisfactory figure, and indeed was larger than at the corresponding date in 1935 by some 17 per cent.

Brazilian Paper Industry

New Sources of Cellulose

STRENUOUS efforts are being made to render the Brazilian paper industry self-supporting in respect of cellulose supplies, reports the "Chemische Industrie." Eucalyptus and pine trees have been planted in San Paolo by Companhia Industrial Agricola Coruputuba on a scale which is expected to cope with the home demand after two years. Incidentally, this concern is already producing cellulose from rice straw at the rate of more than 1,000 tons per annum. Cellulose from the wild tulip tree is exclusively used by the Parana Paper Company at its Morretes works, while bamboo cellulose is the raw material for the Companhia de Itajahy of Santa Catharina with an annual output of 1,200 tons paper. During the past decade the Companhia Melhoramentos de Sao Paulo has investigated the possibility of no fewer than 121 indigenous plants.

Personal Notes

DR. E. B. MAXTED, of Bristol University, is the hon. secretary of the reception committee responsible for the arrangements for the 95th anniversary meetings and banquet of the Chemical Society to be held at Bristol next Thursday. This is the first occasion on which the Society has held its anniversary meetings in the West of England and the co-operation of the local sections of kindred societies as well as of a number of industrial organisations, has been secured in order to make the gatherings worthy of the occasion. Lord Bledisloe is to be the principal guest at the banquet, to be held in the great hall of the Bristol University.

Dr. E. B. Maxted.

MR. WILLIAM CLEMENT ROWDON, F.I.C., A.R.S.M., died, at the age of 70, on April 3, at his home at Clifton, The Avenue, Hale, Altrincham.

MR. E. J. FOX, managing director of the Stanton Ironworks Co., has been elected president of the board of management of the Mansfield Hospital.

MR. FREDERICK CHAMBERS, for many years a director and works manager of the Stanton Ironworks Co., Ltd., has died. Mr. Chambers, who was 79 years of age, contracted a chill and pneumonia supervened. He leaves a widow, two sons and a daughter.

DR. D. F. MARSHALL, of Sheffield, has been awarded the Andrew Carnegie Gold Medal for 1935 for his paper on "Further determinations of the external heat loss of blast furnaces." The award is made by the Council of the Iron and Steel Institute.

SIR HENRY WELLCOME, F.R.S., has had conferred upon him the Cross of an Officer of the Legion of Honour by the President of the French Republic. This decoration is a further tribute to British medical and chemical research, to which Sir Henry has made many notable contributions.

MR. ALEXANDER HADDEN, manager of Imperial Chemicals Insurance, Ltd., has been elected to the board of that company, of which Sir Harry McGowan is the chairman. Imperial Chemicals Insurance was formed in 1927 to deal with the insurance affairs of Imperial Chemical Industries, Ltd.

LORD MELCHETT presented gold medals, gold watches, and silver watches and medals for long service, to the employees of the Gaskell-Marsh and Wigg-Kemet works central traffic, central laboratory, and shipping department, Liverpool, at the I.C.I. recreation pavilion, Widnes, on April 3. Mr. T. Wallis presided, and there were forty-three presentations.

MR. JAMES HAMILTON, secretary of the Scottish Iron and Steel Co., died at his home in Glasgow on March 29. Mr. Hamilton, who was seventy-nine, attended the company's annual meeting on March 20, and was active in the business until a few days ago. He was a partner in William Tudhope, Sons and Co., Coatbridge, which firm was absorbed by the Scottish Iron and Steel Co. in 1912.

MR. W. T. CRESWELL, K.C., chairman of the council of the Royal Sanitary Institute, 1934-35, has been elected a vice-president of the Institute.

MR. THOMAS BRADLEY, J.P., late director and manager of Daniel Adamson and Co., Dukinfield, died on March 28 at his residence, West View, Dalby, Isle of Man.

MR. G. E. HOLDEN, managing director of the English Velvet and Cord Dyers' Association, Ltd., has been appointed chairman in succession to the late Mr. Harry Livsey. MR. PHILIP N. HOYLE, a member of the board, has been appointed managing director and deputy chairman.

MR. PHILIP HENRY GALLOWAY, of 25 Larpent Avenue, Putney, London, S.W., founder and chairman of P. H. Galloway, Ltd., 154-162 Walworth Road, London, S.E., and a director of Jules Frères, Ltd., left estate of the gross value of £259,637, with net personalty £211,908. His bequests included £1,000 to the Benevolent Fund of the Pharmaceutical Society.

SIR JOHN ORR, whose recent work on diet and health in relation to family income has aroused much interest, was one of the chief speakers at a joint meeting of the Engineers' Study Group on Economics and the Association of Scientific Workers at the Royal Society of Arts on March 31. The group's second interim report which was presented outlines a desirable budget for the average family of four, based upon established custom and upon medical and dietetic requirements.

Continental Chemical Notes

Turkey

WORK IS TO BE RESTARTED at the Anamur galena mines, the property of a French company, where ore reserves with a content of 30 per cent. lead and 20 per cent. zinc are estimated at 100,000 tons.

Germany

A COMPANY HAS BEEN FORMED, under the style of Azo Kautschuk-Patent-Verwertungs-G.m.b.H., to exploit certain patents relating to rubber treatment (German Pat. 551,804 and 612,687). The directors are Dr. K. Derflinger and Count Mels-Colloredo (Kaiserallee, 169, Berlin-Wilmersdorf).

France

SAMPLES OF TUNG OIL originating from French Indo-China were recently exhibited at the French Overseas Exhibition.

ACCORDING TO A RECENTLY PATENTED PROCESS of Compagnie Alais, Froges et Camargue, asymmetrical dichlorethylene ($CCl_2 = CH_2$) is obtained in high yield by exposing disymmetric tetrachlorethane ($CCl_3 - CH_2Cl$) to the action of hot water in presence of a metal such as iron, zinc or cadmium (French Pat. 786,803).

RECENT COMPANY REGISTRATIONS include: Produits Chimiques T.B.I., 140, Avenue Felix-Faure, Aubervilliers Seine, capital 50,000 francs (manufacture and distribution of chemical and pharmaceutical products); Société d'Hygiene et Desinfection, 91, quai d'Asnières, Asnières (Seine), capital 25,000 francs (bactericides and insecticides); Clairfin, 16 *bis*, quai de Bercy, Charenton (Seine), capital 100,000 francs (oenological chemicals).

A LICENCE TO OPERATE the Fischer hydrogenation process (catalytic treatment of water gas) in France has been granted to a subsidiary of the Kuhlmann concern ("Soc. des Prod. Chimiques Courrieres-Kuhlmann"). Plans are already in hand for erection of the plant which is expected to be producing motor spirit next year at the rate of 25,000 tons per annum. No direct State financial aid for the enterprise (the initial costs of which are estimated at 4 million francs) has been requested since petrol manufactured in the new plant will be exempt (by virtue of the law of April 4, 1926) from the petrol tax of 32 centimes per litre.

From Week to Week

THE ANNUAL DINNER of the Chemical Engineering Group will be held at the Waldorf Hotel, on April 24, when Lord Amulree will speak on "Aviation."

THE BRITISH DRUG HOUSES, LTD., have just published a booklet containing a short history of liver therapy from its inception until the present epoch-making discovery of Anahaemin, the active hæmatopoietic principle of liver (Dakin and West).

CHEMISTRY IN INDUSTRY was the subject of an address by Professor J. B. Firth, of Nottingham University College, at a meeting of the Nottingham Round Table, on April 1. Professor Firth gave a historical survey of the part played by chemistry in industry and spoke of the rapid progress it had made in English industries since the war.

THE ROAD RESEARCH LABORATORY of the Department of Scientific Research at Harmondsworth spends £50,000 a year in its search for the perfect road. The engineering laboratory contains apparatus which can exert a pressure of 500 tons on sections of concrete to test its strength. In the chemical laboratory minute tests of various grades of stone are carried out and the chemical reasons for the slipperiness of a road are investigated.

THE FIRST ANNUAL GENERAL MEETING of the East Midlands section of the Institute of Chemistry was held in the Chemistry Theatre of University College, Nottingham, on April 2. After officers for the ensuing year had been elected a symposium on "The Institute of Chemistry and Professional Training" was held, the principal contributors being Dr. L. Hunter, Mr. B. A. Bull, and Mr. R. L. Collett, assistant secretary of the Institute.

OWING TO CONTINUED INCREASE in the sales of Humatagraph hygrometers and hygrostatic controls it has been found necessary to make arrangements to provide better facilities for their manufacture. The C. L. Burdick Manufacturing Co. has therefore made arrangements for the manufacture of the instruments to be transferred at an early date to the large and well equipped factories of the Autovac Manufacturing Co., Ltd., at Stockport. The offices will also be transferred to Stockport.

THE IMPORTANCE OF CHEMICAL PRODUCTION in a time of national emergency was stressed by Mr. H. O. Smith, chairman of the Metal Group of Imperial Chemical Industries, Ltd., and a director of the I.C.I., when he spoke to Leeds employees of the concern, on April 3. Mr. Smith was the principal guest at the annual dinner of employees of the Excelsior Motor Radiator Co., Ltd., of New Wortley, Leeds, a branch of I.C.I. He said the Billingham venture was one which would never have started without I.C.I., and which was now assured of being a success.

ALFA-LAVAL CO., LTD., of Brentford, which is the sole agent for Great Britain of Aktiebolaget Separator, of Stockholm, in respect of the manufacture and sale of De Laval separators, has now acquired from Cooke, Troughton and Simms, Ltd.—a subsidiary of Vickers, Ltd.—the business of British Separators, Ltd. These separators are known throughout the trade as "Vickcen" separators. The purchasers are making adequate arrangements for the servicing of "Vickcen" separators and the supply of spare parts. All inquiries for "Vickcen" separators, filters and parts should now be addressed to British Separators, Ltd., Great West Road, Brentford, Middlesex.

FOUR FIRE BRIGADES FOUGHT AN OUTBREAK at the works of Yorkshire Tar Distillers, Ltd., at Kilnhurst, near Rotherham, on March 31. The blaze occurred in the benzol plant, and the whole district was soon covered with thick smoke. Firemen from Sheffield, Rotherham, Wombwell and Wath concentrated on the outbreak, which started in an acid washery, from which the flames spread quickly to the benzol house. Three or four stills containing 12,000 gallons of benzol were in the burning building, and there were several minor explosions. The Rotherham and Sheffield brigades used their foam apparatus with excellent effect, and it was after this was put into use that the flames quickly began to subside.

IN THE COURSE OF AN INTERIM STATEMENT to their shareholders, the directors of Erinoid, Ltd., expose a singularly ill-informed statement recently made in debate in the House of Commons. A Member complained that milk, which ought to be given to children, was being used to make umbrella handles. It is pointed out that even if it were possible to make umbrella handles out of whole milk, the cost would be prohibitive. The standard price of liquid milk is 1s. 3d. per gal., but in districts which are remote from any large towns, so that whole milk cannot be readily marketed, the practice is to separate the milk by extracting the butter fats. From this separated milk, at one time fed to pigs, certain solids are now extracted and used in many manufactures, including that of umbrella handles. The solids cannot be extracted at a profit unless the separated milk is procurable at the price of one penny per gal. (one-fifteenth of the price of whole milk). As separated milk is not usually available at that price in England almost the whole of the solids referred to are imported from abroad, so that the Member's complaint had no relation to facts.

THE LAST MEETING of the Institution of Chemical Engineers of the present session will be held at Burlington House, on April 22, when Dr. D. M. Newitt will present a paper on "The Design of Vessels to Withstand High Internal Pressure."

A TOTAL OF 189 KILOGRAMS OF MAGNESIUM, the first to be produced in the Soviet Union, was obtained last week at the new Solikamsk electrolytic plant, constructed for the production of metallic magnesium from the Solikamsk carnalites which form part of the U.S.S.R. potassium deposits. Five electrolytic baths will have been put into operation at the plant by the end of the month.

ARRANGEMENTS HAVE BEEN MADE for a joint meeting of the Institution of Chemical Engineers with the American Institute of Chemical Engineers, to take place from June 28 to July 5, immediately following the Chemical Engineering Congress. The tour arranged is very attractive and reasonable in cost. Official forms for notification of participation will shortly be issued, and members are asked particularly to note that these will be returnable by May 15.

A REPRESENTATION HAS BEEN MADE to the Board of Trade under Section 10(5) of the Finance Act, 1926, for the exemption from Key Industry Duty of a microphotometer, and photographic camera with supplementary stand, separately mounted lenses, and optical filter, specially adapted for use with a high speed centrifuge for the optical analysis of proteins in liquids. Any communication should be addressed to the Principal Assistant Secretary, Industries and Manufactures Department, Board of Trade, Great George Street, S.W.1, not later than May 3.

A NEW EDITION of the Medical Scales for merchant vessels, to come into force forthwith, has been issued by the Stationery Office (9d. net). The new issue of these Scales is necessitated by new issues of the British Pharmacopœia in 1932 and of the British Pharmaceutical Codex in 1934. The Medical Scales have been revised to accord with these new issues. Apart from the alterations necessary for this purpose very few alterations have been made in the new Scales, but certain instruments are now required to be of rustless and stainless metal throughout, while the requirement in the 1931 Scales that phenol or carbolic acid disinfectants must be miscible with sea water in a certain manner has been omitted. Minor alterations of a clarifying kind in the form of the Scales have been made.

A SPECIAL COURSE OF SYSTEMATIC SCIENTIFIC INSTRUCTION for probationers in the Liverpool C.I.D. has been instituted, and if it is found that the results warrant it, the course will become a regular feature of the training of recruits. The intention is to train the men to appreciate that a minute fragment found on the scene of a crime may enable the scientist to lead them to the criminal. A number of young men have just completed the first course of this kind of instruction, carried out at the Liverpool Central Technical College under the principal, Mr. R. R. Butler. The course covered a great range of subjects, from the identification of persons by finger and foot prints, the microscopical examination of hair, fur and fibre, and the chemical study of skin and clothing, to the analysis of colouring matters on or in any object concerned in an inquiry.

RECENT INVESTIGATIONS HAVE SHOWN that even a very dilute solution of Russell viper venom has hæmostatic properties which are of great use clinically. "Stypven," prepared at the Wellcome Physiological Research Laboratories, presents Russell viper venom in the most convenient form. It is issued in rubber-stoppered bottles accompanied by hermetically-sealed ampoules of solvent consisting of sterile distilled water containing 0.5 per cent. phenol. A solution of Russell viper venom of the necessary concentration is thus readily prepared by adding the solvent to the "Stypven" in the rubber-stoppered bottles provided. The external bleeding which usually occurs in hæmophilies after the extraction of teeth may now be controlled and the extraction undertaken with reasonable safety. Further, "Stypven" acts as a hæmostatic in any external wounds suffered by hæmophilics.

HAY WAS MADE from English grass in March this year. By the aid of the newly developed Billingham grass drier early spring grass on the farm of Mr. Clyde Higgs, Hatton Rock, near Stratford-on-Avon, was dried and baled. The occasion was a course of instruction given in grass drying by Imperial Chemical Industries, Ltd., on March 30 and 31, to thirty farm men sent by purchasers of grass drying machines. Sufficient spring grass was available and the men took turns in carrying out all the operations of drying and baling. The dried grass was a beautiful green colour and smelt of newly mown grass rather than hay. The whole operation, including cutting, drying and baling, took only about thirty minutes. It is hoped that drying will continue in full swing from now onwards and that two or three cuts of grass will be obtained by mid-June, when haymaking is beginning on other farms. Farmers interested will have an opportunity of seeing grass drying in operation at a demonstration which is to be held at Hatton Rock on April 28 and 29. Tickets to attend on either of these days may be obtained from Mr. Clyde Higgs at that address.

Weekly Prices of British Chemical Products

THERE are no price changes to report in the markets for wood distillation products, tar products, pharmaceutical and photographic chemicals, perfumery chemicals, essential oils and intermediates. Chromic acid has been reduced by a halfpenny per lb., and in the rubber chemical market there have been slight reductions in cadmium sulphide, india-rubber substitutes, and sulphur. Unless otherwise stated the prices below cover fair quantities net and naked at sellers' works.

LONDON.—Prices remain steady in the London chemical market, and there has been a noteworthy increase in the demand for chemicals during the past week.

MANCHESTER.—The approach of the Easter holidays has had its usual influence on trading conditions on the Manchester chemical market during the past week. Comparatively little new business of any importance has been reported by sellers and whilst at the moment of writing there has been no falling off in the demand for chemicals againts existing commitments, there will be the customary suspensions of deliveries until about the middle of next week. From the point of view of market values, however, there has not been much change in the general situation, the alkali and most other heavy products, in particular, keeping quite firm. Among the tar products, cresylic acid and naphthalene are extremely strong sections and spot supplies in both cases are difficult to secure. Heavy naphtha and the light distillates are selling in moderate quantities and quotations are steady.

SCOTLAND.—There has been an improved demand for chemicals during the week, and rather more inquiry for export. Prices generally continue very firm at about previous figures with only slight changes to report.

General Chemicals

ACETONE.—LONDON: £62 to £65 per ton; SCOTLAND: £64 to £65 ex wharf, according to quantity.

ACID, ACETIC.—40% technical, £16 12s. 6d. per ton. LONDON: Tech., 80%, £30 5s. to £32 5s. per ton; pure 80%, £32 5s. to £34 5s.; tech., 40%, £16 12s. 6d. to £18 12s. 6d.; tech., 60%, £23 10s. to £25 10s. SCOTLAND: Glacial 98/100%, £48 to £52; pure 80%, £32 5s.; tech., 80%, £30 5s., d/d buyers' premises Great Britain. MANCHESTER: 80%, commercial, £30 5s.; tech. glacial, £48 to £50.

ACID, BORIC.—Commercial granulated, £27 per ton; crystal, £28; powdered, £29; extra finely powdered, £31; packed in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. B.P. cryst., £36; B.P. powder, £37. SCOTLAND: Crystals, £28; powdered, £29.

ACID, CHROMIC.—Flaked, 10d. per lb., less 2½%; ground, 10¼d. per lb., less 2½%, d/d U.K.

ACID, CITRIC.—11¾d. per lb. MANCHESTER: 1s. SCOTLAND: 11¾d.

ACID, CRESYLIC.—97/100%, 1s. 5d. to 1s. 6d. per gal.; 99/100%, refined, 1s. 9d. to 1s. 10d. per gal. LONDON: 98/100%, 1s. 5d. f.o.r.; dark, 1s.

ACID, FORMIC.—LONDON: £42 to £47 per ton.

ACID, HYDROCHLORIC.—Spot, 4s. to 6s. carboy d/d according to purity, strength and locality. SCOTLAND: Arsenical quality, 4s.; dearsenicated, 5s. ex works, full wagon loads.

ACID, LACTIC.—LANCASHIRE: Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £50; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £55; edible, 50% by vol., £41. One-ton lots ex works, barrels free.

ACID, NITRIC.—80° Tw. spot, £18 to £25 per ton makers' works. SCOTLAND: 80°, £24 ex station full truck loads.

ACID, OXALIC.—LONDON: £47 17s. 6d. to £57 10s. per ton, according to packages and position. SCOTLAND: 98/100%, £48 to £50 ex store. MANCHESTER: £48 10s. to £54 ex store.

ACID, SULPHURIC.—SCOTLAND: 144° quality, £3 12s. 6d.; 168°, £7; dearsenicated, 20s. per ton extra.

ACID, TARTARIC.—1s. per lb. less 5%, carriage paid for lots of 5 cwt. and upwards. LONDON: 11¼d., less 5%. SCOTLAND: 1s. 0¼d. less 5%. MANCHESTER: 1s. per lb.

ALUM.—SCOTLAND: Lump potash, £8 10s. per ton ex store.

ALUMINA SULPHATE.—LONDON: £7 10s. to £8 per ton. SCOTLAND: £7 to £8 ex store.

AMMONIA, ANHYDROUS.—Spot, 10d. per lb. d/d in cylinders. SCOTLAND: 10d. to 1s. containers extra and returnable.

AMMONIA, LIQUID.—SCOTLAND: 80°, 2½d. to 3d. per lb., d/d.

AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.

AMMONIUM CARBONATE.—SCOTLAND: Lump, £30 per ton; powdered, £33, in 5-cwt. casks d/d buyers' premises U.K.

AMMONIUM CHLORIDE.—LONDON: Fine white crystals, £18 to £19. (See also Salammoniac.)

AMMONIUM CHLORIDE (MURIATE).—SCOTLAND: British dog tooth crystals, £32 to £35 per ton carriage paid according to quantity. (See also Salammoniac.)

AMMONIUM SULPHATE.—Neutral quality, 20.6% nitrogen, £7 per ton.

ANTIMONY OXIDE.—SCOTLAND: £61 to £65 per ton, c.i.f. U.K. ports.

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 1d. per lb.; crimson, 1s. 5½d. to 1s. 7d. per lb., according to quality.

ARSENIC.—LONDON: £15 per ton c.i.f. main U.K. ports for imported material; Cornish nominal, £22 10s. f.o.r. mines. SCOTLAND: White powdered, £23 ex wharf. MANCHESTER: White powdered Cornish, £22, ex store.

ARSENIC SULPHIDE.—Yellow, 1s. 5d. to 1s. 7d. per lb.

BARIUM CHLORIDE.—LONDON: £10 10s. per ton. SCOTLAND: £10 10s. to £10 15s.

BARYTES.—£6 10s. to £8 per ton.

BISULPHITE OF LIME.—£6 10s. per ton f.o.r. London.

BLEACHING POWDER.—Spot, 35/37%, £7 19s. per ton d/d station in casks, special terms for contract. SCOTLAND: £9 5s.

BORAX, COMMERCIAL.—Granulated, £14 10s. per ton; crystal, £15 10s.; powdered, £16; finely powdered, £17; packed in 1-cwt. bags, carriage paid home to buyer's premises within the United Kingdom in 1-ton lots.

CADMIUM SULPHIDE.—5s. 2d. to 5s. 5d. per lb.

CALCIUM CHLORIDE.—Solid 70/75% spot, £5 5s. per ton d/d station in drums.

CARBON BISULPHIDE.—£31 to £33 per ton, drums extra.

CARBON BLACK.—3¾d. to 4¾d. per lb. LONDON: 4½d. to 5d.

CARBON TETRACHLORIDE.—SCOTLAND: £41 to £43 per ton, drums extra.

CHROMIUM OXIDE.—10¾d. per lb., according to quantity d/d U.K.; green, 1s. 2d. per lb.

CHROMETAN.—Crystals, 2⅝d. per lb.; liquor, £19 10s. per ton d/d

COPPERAS (GREEN).—SCOTLAND: £3 15s. per ton, f.o.r. or ex works.

CREAM OF TARTAR.—£3 19s. per cwt. less 2½%. LONDON: £3 17s. per cwt. SCOTLAND: £3 16s. 6d. net.

DINITROTOLUENE.—66/68° C., 9d. per lb.

DIPHENYLGUANIDINE.—2s. 2d. per lb.

FORMALDEHYDE.—LONDON: £24 10s. per ton. SCOTLAND: 40%, £25 to £28 ex store.

IODINE.—Resublimed B.P., 6s. 3d. to 8s. 4d. per lb.

LAMPBLACK.—£45 to £48 per ton.

LEAD ACETATE.—LONDON: White, £36 10s. per ton; brown, £1 per ton less. SCOTLAND: White crystals, £34 to £35; brown, £1 per ton less. MANCHESTER: White, £36; brown, £34 to £35.

LEAD NITRATE.—£32 10s. to £34 10s. per ton.

LEAD, RED.—SCOTLAND: £26 to £28 per ton less 2½%; d/d buyer's works.

LEAD, WHITE.—SCOTLAND: £39 per ton, carriage paid. LONDON: £41.

LITHOPONE.—30%, £16 5s. to £16 10s. per ton.

MAGNESITE.—SCOTLAND: Ground calcined, £9 per ton, ex store.

MAGNESIUM CHLORIDE.—SCOTLAND: £7 per ton.

MAGNESIUM SULPHATE.—Commercial, £5 per ton, ex wharf.

METHYLATED SPIRIT.—61 O.P. industrial, 1s. 5d. to 2s. per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities. SCOTLAND: Industrial 64 O.P., 1s. 9d. to 2s. 4d.

PHENOL.—6¾d. to 7¼d. per lb. to June 30, 1936.

POTASH, CAUSTIC.—LONDON: £42 per ton. MANCHESTER: £39.

POTASSIUM BICHROMATE.—Crystals and Granular, 5d. per lb. less 5%, d/d U.K. Ground, 5¼d. LONDON: 5d. per lb. less 5%, with discounts for contracts. SCOTLAND: 5d. d/d U.K. or c.i.f. Irish Ports. MANCHESTER: 5d.

POTASSIUM CHLORATE.—LONDON: £37 to £40 per ton. SCOTLAND: 99¾/100%, powder, £37. MANCHESTER: £38.

POTASSIUM CHROMATE.—6¼d. per lb. d/d U.K.

POTASSIUM IODIDE.—B.P., 5s. 2d. per lb.

POTASSIUM NITRATE.—SCOTLAND: Refined granulated, £29 per ton c.i.f. U.K. ports. Spot, £30 per ton ex store.

POTASSIUM PERMANGANATE.—LONDON: 8¼d. per lb. SCOTLAND: B.P. crystals, 10d. to 10¼d. MANCHESTER: B.P., 11¼d.

POTASSIUM PRUSSIATE.—LONDON: Yellow, 8¼d. to 8¾d. per lb. SCOTLAND: Yellow spot, 8¼d. ex store. MANCHESTER: Yellow, 8¼d.

SALAMMONIAC.—First lump spot, £41 17s. 6d. per ton d/d in barrels. SCOTLAND: Large crystals, in casks, £36.

SODA ASH.—58% spot, £5 12s. 6d. per ton f.o.r. in bags.

SODA, CAUSTIC.—Solid, 76/77° spot, £13 17s. 6d. per ton d/d station. SCOTLAND: Powdered 98/99%, £17 10s. in drums, £18 5s. in casks, Solid 76/77°, £14 12s. 6d. in drums; 70/73%, £14 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts 10s. per ton less. MANCHESTER: £13 5s. to £14 contracts.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE.—LONDON: £21 per ton. SCOTLAND: £20 15s.

SODIUM BICARBONATE.—Refined spot, £10 10s. per ton d/d station in bags. SCOTLAND: Refined recrystallised £10 15s. ex quay or station. MANCHESTER: £10 10s.

SODIUM BICHROMATE.—Crystals cake and powder 4d. per lb. net d/d U.K. discount 5%. Anhydrous, 5d. per lb. LONDON: 4d. per lb. less 5% for spot lots and 4d. per lb. with discounts for contract quantities. MANCHESTER: 4d. per lb. basis. SCOTLAND: 4d. delivered buyer's premises with concession for contracts.

SODIUM BISULPHITE POWDER.—60/62%, £20 per ton d/d 1 cwt. iron drums for home trade.

SODIUM CARBONATE, MONOHYDRATE.—£15 per ton d/d in minimum ton lots in 2 cwt. free bags. Soda crystals, SCOTLAND: £5 to £5 5s. per ton ex quay or station. Powdered or pea quality, 7s. 6d. per ton extra. Light Soda Ash, £7 ex quay, min. 4-ton lots with reductions for contracts.

SODIUM CHLORATE.—£30 per ton. SCOTLAND: 3⅝d. per lb.

SODIUM CHROMATE.—4d. per lb. d/d U.K.

SODIUM HYPOSULPHITE.—SCOTLAND: Large crystals English manufacture, £9 5s. per ton ex stations, min. 4-ton lots. Pea crystals, £14 10s. ex station, 4-ton lots. MANCHESTER: Commercial, £10 5s.; photographic, £14 10s.

SODIUM METASILICATE.—£14 per ton, d/d U.K. in cwt. bags.

SODIUM IODIDE.—B.P., 6s. per lb.

SODIUM NITRITE.—LONDON: Spot, £18 5s. to £20 5s. per ton d/d station in drums.

SODIUM PERBORATE.—10%, 9¼d. per lb. d/d in 1-cwt. drums. LONDON: 10d. per lb.

SODIUM PHOSPHATE.—£13 per ton.

SODIUM PRUSSIATE.—LONDON: 5d. to 5¼d. per lb. SCOTLAND: 5d. to 5¾d. ex store. MANCHESTER: 5d. to 5¼d.

SODIUM SILICATE.—140° Tw. Spot, £8 per ton. SCOTLAND: £8 10s.

SODIUM SULPHATE (GLAUBER SALTS).—£4 2s. 6d. per ton d/d SCOTLAND: English material, £3 15s.

SODIUM SULPHATE (SALT CAKE).—Unground spot, £3 12s. 6d. per ton d/d station in bulk. SCOTLAND: Ground quality, £3 5s. per ton d/d. MANCHESTER: £3 2s. 6d. to £3 5s.

SODIUM SULPHIDE.—Solid 60/62% Spot, £10 15s. per ton d/d in drums; crystals 30/32%, £8 per ton d/d in casks. SCOTLAND: For home consumption, Solid 60/62%, £10 5s.; broken 60/62%, £11 5s.; crystals, 30/32%, £8 7s. 6d., d/d buyer's works on contract, min. 4-ton lots. Spot solid, 5s. per ton extra. Crystals, 2s. 6d. per ton extra. MANCHESTER: Concentrated solid, 60/62%, £11; commercial, £8 2s. 6d.

SODIUM SULPHITE.—Pea crystals, spot, £13 10s. per ton d/d station in kegs. Commercial spot, £8 15s. d/d station in bags.

SULPHUR.—£9 to £9 5s. per ton. SCOTLAND: £8 to £9.

SULPHATE OF COPPER.—MANCHESTER: £15 per ton f.o.b.

SULPHUR CHLORIDE.—5d. to 7d. per lb., according to quality.

SULPHUR PRECIP.—B.P., £55 to £60 per ton according to quantity. Commercial, £50 to £55.

VERMILION.—Pale or deep, 5s. 1d. per lb. in 1-cwt. lots.

ZINC CHLORIDE.—SCOTLAND: British material, 98%, £18 10s. per ton f.o.b. U.K. ports.

ZINC SULPHATE.—LONDON: £12 per ton. SCOTLAND: £10 10s.

ZINC SULPHIDE.—10d. to 11d. per lb.

Nitrogen Fertilisers

SULPHATE OF AMMONIA.—£7 5s. per ton for neutral quality basis 20.6% nitrogen delivered in 6-ton lots to farmer's nearest station.

CALCIUM CYANAMIDE.—£7 5s. per ton, delivered in 4-ton lots.

NITRO-CHALK.—£7 5s. per ton delivered in 6-ton lots to farmer's nearest station.

NITRATE OF SODA.—£7 12s. 6d. per ton delivered in 6-ton lots to farmer's nearest station.

CONCENTRATED COMPLETE FERTILISERS.—£10 10s. to £10 19s. per ton according to analysis, delivered in 6-ton lots to farmer's nearest station.

AMMONIUM PHOSPHATE (N.P.) FERTILISERS.—£10 5s. to £13 15s. per ton according to analysis, delivered in 6-ton lots to farmer's nearest station.

Coal Tar Products

ACID, CRESYLIC.—99/100%, 2s. 1d. to 3s. per gal., according to specification; pale 98%, 1s. 10d. to 2s.; dark, 1s. 6d. to 1s. 7d. LONDON: 98/100%, 1s. 4d.; dark, 95/97%, 1s. SCOTLAND: Pale, 99/100%, 1s. 3d. to 1s. 4d.; dark, 97/99%, 1s. to 1s 1d.; high boiling acid, 2s. 6d. to 3s.

ACID, CARBOLIC.—Crystals, 6¾d. to 7½d. per lb.; crude, 60's, 2s. 3d. to 2s. 6d. per gal. MANCHESTER: Crystals, 7d. per lb.; crude, 2s. 2d. per gal. SCOTLAND: 60's, 2s. 6d. to 2s. 7d.

BENZOL.—At works, crude, 8½d. to 9d. per gal.; standard motor 1s. 2d. to 1s. 2½d.; 90%, 1s. 3d. to 1s. 3½d.; pure, 1s. 7d. to 1s. 7½d. LONDON: Motor, 1s 3½d. SCOTLAND: Motor, 1s. 6½d.

CREOSOTE.—B.S.I. Specification standard, 5½d. per gal. f.o.r. Home, 3¾d. d/d. LONDON: 4½d. f.o.r. North; 5d. London. MANCHESTER: 5d. SCOTLAND: Specification oils, 4d.; washed oil, 4¼d. to 4¾d.; light, 4½d.; heavy, 4¼d. to 4½d.

NAPHTHA.—Solvent, 90/100%, 1s. 5½d. to 1s. 6½d. per gal.; 95/160%, 1s. 9d.; 90%, 1s. to 1s. 2d. LONDON: Solvent, 1s. 3½d. to 1s. 4d.; heavy, 11d. to 1s. 0½d. f.o.r. SCOTLAND: 90/160%, 1s. 3d. to 1s. 3½d.; 90/190%, 11d. to 1s. 2d.

NAPHTHALENE.—Crude, whizzed or hot pressed, £17 10s. per ton; purified crystals, £26 per ton in 2-cwt. bags. LONDON: Fire lighter quality, £3 to £3 10s.; 74/76 quality, £4 to £4 10s.; 76/78 quality, £5 10s. to £6. SCOTLAND: 40s. to 50s.; whizzed, 70s. to 75s.

PYRIDINE.—90/140%, 5s. 3d. to 7s. 6d. per gal.; 90/180, 2s. 3d.

TOLUOL.—90%, 2s. 3d. per gal.; pure, 2s. 7d.

XYLOL.—Commercial, 2s. 2d. per gal.; pure, 2s. 4d.

PITCH.—Medium, soft, 42s. 6d. to 43s. per ton, in bulk at makers' works. MANCHESTER: 37s. 6d. f.o.b., East Coast.

Wood Distillation Products

ACETATE OF LIME.—Brown, £7 15s. to £8 10s. per ton; grey, £10 10s. to £11. Liquor, brown, 30° Tw., 8d. per gal. MANCHESTER: Brown, £9 10s.; grey, £11.

CHARCOAL.—£5 to £10 per ton, according to grade and locality.

METHYL ACETONE.—40-50%, £46 to £50 per ton.

WOOD CREOSOTE.—Unrefined, 6d. to 1s. 3d. per gal.

WOOD NAPHTHA, MISCIBLE.—2s. 6d. to 3s. 3d. per gal.; solvent, 3s. to 4s. per gal.

WOOD TAR.—£2 to £2 10s. per ton.

Intermediates and Dyes

ACID, BENZOIC, 1914 B.P. (ex Toluol).—1s. 9½d. per lb.

ACID, GAMMA.—Spot, 4s. per lb. 100% d/d buyer's works.

ACID, H.—Spot, 2s. 4½d. per lb. 100% d/d buyer's works.

ACID NAPHTHIONIC.—1s. 8d. per lb.

ACID, NEVILLE AND WINTHER.—Spot, 3s. per lb. 100%.

ACID, SULPHANILIC.—Spot, 8d. per lb. 100%, d/d buyer's works.

ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.

ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.

BENZALDEHYDE.—Spot, 1s. 8d. per lb., packages extra.

BENZIDINE BASE.—Spot, 2s. 5d. per lb., 100% d/d buyer's works.

BENZIDINE HCL.—2s. 5d. per lb.

o-CRESOL 30/31° C.—6d. per lb. in 1-ton lots.

p-CRESOL 34-5° C.—1s. 6d. per lb. in ton lots.

m-CRESOL 98/100%.—1s. 7d. per lb. in ton lots.

DICHLORANILINE.—1s. 11½d. to 2s. 3d. per lb.

DIMETHYLANILINE.—Spot, 1s. 6d. per lb., package extra.

DINITROBENZENE.—8d. per lb.

DINITROTOLUENE.—48/50° C., 9d. per lb.; 66/68° C., 10½d.

DINITROCHLORBENZENE, SOLID.—£72 per ton.

DIPHENYLAMINE.—Spot, 2s. per lb., d/d buyer's works.

α-NAPHTHOL.—Spot, 2s. 4d. per lb., d/d buyer's works.

β-NAPHTHOL.—Spot, £78 15s. per ton, in paper bags.

α-NAPHTHYLAMINE.—Spot, 11½d. per ton., d/d buyer's works.

β-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb., d/d buyer's works.

o-NITRANILINE.—3s. 11d. per lb.

m-NITRANILINE.—Spot, 2s. 7d. per lb., d/d buyer's works.

p-NITRANILINE.—Spot, 1s. 8d. per lb., d/d buyer's works.

NITROBENZENE.—Spot, 4½d. to 5d. per lb.; 5-cwt. lots, drums extra.

NITRONAPHTHALENE.—9d. per lb.; P.G., 1s. 0½d. per lb.

SODIUM NAPHTHIONATE.—Spot, 1s. 9d. per lb.

o-TOLUIDINE.—9½d. to 11d. per lb.

p-TOLUIDINE.—1s. 11d. per lb.

Latest Oil Prices

LONDON, April 7.—LINSEED OIL was steady. Spot, £28 15s. (small quantities); April, £26 5s.; May-Aug., £26 7s. 6d.; Sept.-Dec., £26 10s., naked. SOYA BEAN OIL was firm. Oriental (bulk), April shipment, £22. RAPE OIL was quiet. Crude, extracted, £34 10s.; technical refined, £36, naked, ex wharf. COTTON OIL was quiet. Egyptian crude, £25; refined common edible, £28 5s.; deodorised, £30 5s., naked, ex mill (small lots £1 10s. extra). TURPENTINE was again lower. American, spot, 43s. per cwt.

HULL.—LINSEED OIL.—Spot quoted £26 15s. per ton; April, £26 5s.; May-Aug., £26 7s. 6d.; Sept.-Dec., £26 10s. COTTON OIL.—Egyptian, crude, spot, £25 5s. per ton; edible, refined, spot, £27 10s.; technical, spot, £27 10s.; deodorised, £29 10s., naked. PALM KERNEL OIL.—Crude, f.m.q., spot, £23 per ton, naked. GROUNDNUT OIL.—Extracted, spot, £30 10s. per ton; deodorised, £33 10s. RAPE OIL.—Extracted, spot, £33 10s. per ton; refined, £35. SOYA OIL.—Extracted, spot, £26 10s. per ton; deodorised, £29 10s. COD OIL.—F.o.r. or f.a.s., 25s. per cwt., in barrels. CASTOR OIL.—Pharmaceutical, 42s. 6d. per cwt.; first, 37s. 6d.; second, 35s. 6d. TURPENTINE.—American, spot, 45s. per cwt.

Books Received

Fabrikation von absolutem Alkoholzwecks Verwendung als Zusatzmittel zu Motor-Treibstoffen. By M. Klar. Halle: Wilhelm Knapp. Pp. 84. R.M. 6.80.

Glances at Industrial Research. By Edward R. Weidlein and William A. Hamor. London: Chapman and Hall. New York: Reinhold Publishing Corporation. Pp. 246. 13s. 6d.

Chemical and Allied Stocks and Shares

EASTER holidays have made for a reduction of business in the stock and share markets and on balance for the week the general tendency in industrial shares has been to move moderately against holders. Shares of chemical and allied shares were steady and show few important changes as compared with a week ago. Imperial Chemical continued to attract increased attention in anticipation of the full results and the annual meeting. The latter is to be held on April 27, and the usual interesting review of the company's widespread activities is being awaited with much interest in the market as it may provide important indications as to the outlook for the current year. Boots Pure Drug remained prominent on the continued belief in the market that in addition to the maintenance of the dividend and cash bonus there may be a share bonus this year, or possibly an offer of additional shares on favourable terms. British Oxygen units have been steadier, awaiting the past year's results, which can be expected towards the end of the month or early in May. Goodlass Wall and Lead Industries ordinary have also been firm. The results are due shortly and there are continued anticipations of a larger dividend. The market remains hopeful of 7½ per cent. against the previous year's 6 per cent. British Drug Houses and Blythe Chemical were unchanged, awaiting the results, which in both cases may show that the recently declared dividends are conservative payments. Burt, Boulton and Haywood continued to hold the higher price at 21s. 3d. to which they went following the increase in the interim dividend. British Tar Products 5s. ordinary shares have kept at 12s. 6d. aided by the maintenance of the interim dividend at 6¼ per cent. Lever Brothers preference were firm, having remained under the influence of the increase in the past year's profits to a new high record for the company. Unilever ordinary also held up well. Imperial Smelting have been steady, the view having persisted in the market that, granted there is no heavy fall in the price of zinc below its present level, there will be prospects of dividends being resumed with a payment of 5 per cent. for the current year. Staveley Coal and Iron ordinary have again been good on the possibility of a larger dividend. Tarmac have kept around 26s. 6d. Dorman Long and shares of most other companies which are important steel producers have been rather less active, owing to a disposition to await the expected announcement of an increase in steel prices. The increase is expected to be moderate, but even so it would probably be of importance to the large producers. General Refractories have made rather higher prices and these 10s. shares are 31s. 9d. at the time of writing, the statements at the meeting having increased the view that the business probably has considerable further scope for expansion. Johnson Matthey preference shares and debentures have, as usual, continued to be held very firmly. The results for the past year fall to be issued shortly. For the previous year there was a large increase in net profits to £204,320, and after allowing for debenture interest, the preference dividend and the larger dividend of 8 per cent. on the privately held ordinary shares, the carry forward was raised from £116,529 to £221,231. The results of B. Laporte are also due to be issued shortly. The market is anticipating a further increase in profits and that the dividend will be maintained at 20 per cent. despite the larger capital ranking. British Oil and Cake Mills preferred ordinary shares were unchanged. On the basis of their 12½ per cent. dividend they offer a yield of well over 5 per cent., and in view of last year's larger profits their dividend is covered nearly twice over. The directors have stated that the increased import duty on linseed oil will be of benefit to the company. United Premier Oil and Cake were firm, aided by the meeting. Pinchin, Johnson and other paint shares remained steady. Leading oil shares have been less active, but Anglo-Iranian were relatively steady, aided by market hopes that the dividend may be raised from 12½ to 17½ per cent.

Name.	April 7.	March 31.
Anglo-Iranian Oil Co., Ltd. Ord.	93/9	91/3
,, 8% Cum. Pref.	37/9	37/6
,, 9% Cum. Pref.	38/3	38/3
Associated Dyers and Cleaners, Ltd. Ord.	**1/10½**	**1/10½**
,, 6½% Cum. Pref.	6/6¾	6/6¾
Associated Portland Cement Manufacturers, Ltd. Ord.	88/9	86/3
,, 5½% Cum. Pref.	27/-	27/-
Benzol & By-Products, Ltd. 6% Cum. Part Pref.	6/3	6/3
Berger (Lewis) & Sons, Ltd. Ord.	70/7½	69/4½
Bleachers' Association, Ltd. Ord.	5/7½	5/7½
,, 5½% Cum. Pref.	10/7½	10/7½
Boake, A., Roberts & Co., Ltd. 5% Pref. (Cum.)	**20/-**	**20/-**
Boots Pure Drug Co., Ltd. Ord. (5/-)	55/9	55/6
Borax Consolidated, Ltd. Pfd. Ord. (£)	112/6	112/6
,, Defd. Ord.	28/9	28/1½
,, 5¼% Cum. Pref. (£10)	£12	£12
,, **4½% Deb. (1st Mort.) Red. (£100)**	**£107/10/-**	**£107/10/-**
,, **4½% 2nd Mort. Deb. Red. (£100)**	**£105/10/-**	**£105/10/-**
Bradford Dyers' Association, Ltd. Ord.	8/9	8/9
,, 5% Cum. Pref.	11/10½	12/6
,, **4% 1st Mort. Perp. Deb. (£100)**	**£86/10/-**	**£86/10/-**
British Celanese, Ltd. 7% 1st Cum. Pfd.	25/3	25/-
,, 7½% Part. 2nd Cum. Pref.	21/-	20/6
British Cotton & Wool Dyers' Association Ltd. Ord. (5/-)	6/-	6/-
,, 4% 1st Mort. Deb. Red. (£100)	**£97**	**£97**
British Cyanides Co., Ltd., Ord. (2/-)	4/-	4/-
British Drug Houses, Ltd. Ord.	**21/3**	**21/3**
,, **5% Cum. Pref.**	**21/10½**	**21/10½**
British Glues and Chemicals, Ltd. Ord. (4/-)	8/9	8/9
,, 8% Pref. (Cum. and Part.)	29/4½	29/4½
British Oil and Cake Mills, Ltd. Cum. Pfd. Ord.	48/1½	48/9
,, 5½% Cum. Pref.	27/6	27/6
,, **4¼% First Mort. Deb. Red. (£100)**	**£107/10/-**	**£107/10/-**
British Oxygen Co., Ltd. Ord.	95/-	92/6
,, **6½% Cum. Pref.**	**32/6**	**32/6**
British Portland Cement Manufacturers, Ltd. Ord.	91/3	90/-
,, 6% Cum. Pref.	29/4½	29/4½
Bryant & May, Ltd. Pref.	**67/6**	**67/6**
Burt, Boulton & Haywood, Ltd. Ord.	21/3	21/3
,, 7% Cum. Pref.	28/9	28/9
,, **6% 1st Mort. Deb. Red. (£100)**	**£102/10/-**	**£102/10/-**
Bush, W. J., & Co., Ltd. 5% Cum. Pref. (£5)	108/9	108/9
,, 4% 1st Mort. Deb. Red. (£100)	£94/10/-	£94/10/-

Name.	April 7.	March 31.
Calico Printers' Association, Ltd. Ord.	**8/1½**	**8/1½**
,, 5% Pref. (Cum.)	11/10½	12/6
Cellulose Acetate Silk Co., Ltd. Ord.	12/2½	12/2½
,, Deferred (1/-)	2/1½	2/1½
Consett Iron Co., Ltd. Ord.	11/9	11/9
,, 8% Pref.	38/9	37/6
,, **6% First Deb. stock, Red. (£100)**	£115/10/-	£115/10/-
Cooper, McDougal & Robertson, Ltd. Ord.	35/-	35/-
,, 7% Cum. Pref.	28/9	28/9
Courtaulds, Ltd. Ord.	51/3	50/-
,, 5% Cum.	25/7½	25/7½
Crosfield, Joseph, & Sons, Ltd. 5% Cum. Pre-Pref.	25/-	25/-
,, Cum. 6% Pref.	28/1½	28/1½
,, 6½% Cum. Pref.	30/-	30/-
,, 7½% "A" Cum. Pref.	31/10½	31/10½
Distillers Co., Ltd. Ord.	101/-	99/9
,, 6% Pref. Stock Cum.	30/-	30/-
Dorman Long & Co., Ltd. Ord.	28/9	28/9
,, Pref. Ord.	40/-	40/-
,, 6½% Non-Cum. 1st Pref.	25/-	25/-
,, 8% Non-Cum. 2nd Pref.	25/-	25/-
,, **4% First Mort. Perp. Deb. (£100)**	**£103/10/-**	**£103/10/-**
,, 5% 1st Mort. Red. Deb. (£100)	£106/10/-	£106/10/-
English Velvet & Cord Dyers' Association Ltd. Ord.	3/9	3/9
,, 5% Cum. Pref.	7/6	6/3
,, **4% First Mort. Deb. Red. (£100)**	£67/10/-	£67/10/-
Fison, Packard & Prentice, Ltd. Ord.	45/-	45/-
,, 7% Non-Cum. Pref.	31/10½	31/10½
,, **4½% Debs. (Reg.) Red. (£100)**	**£106**	**£106**
Gas Light and Coke Co.	28/-	27/9
,, 3½% Maximum Stock (£100)	£90/10/-	£90/10/-
,, 4% Consolidated Pref. Stock (£100)	£106/10/-	£107/10/-
,, 3% Consolidated Deb. Stock, Irred. (£100)	£89/10/-	£89/10/-
,, 5% Deb. Stock Red. (£100)	£118/10/-	£118/10/-
,, 4½% Red. Deb. Stock (1960-65) (£100)	£115/10/-	£115/10/-
Goodlass Wall & Lead Industries, Ltd. Ord. (10/-)	15/7½	15/7½
,, 7% Prefd. Ord. (10/-)	13/1½	13/1½
,, 7% Cum. Pref.	28/9	28/9
Gossage, William, & Sons, Ltd. 5% 1st Cum. Pref.	24/4½	24/4½
,, 6½% Cum. Pref.	28/9	28/9
Imperial Chemical Industries, Ltd. Ord.	39/6	38/6
,, Deferred (10/-)	9/7½	9/4½
,, 7% Cum. Pref.	33/3	33/3
Imperial Smelting Corporation, Ltd. Ord.	17/9	17/9
,, 6½% Pref. (Cum.)	25/7½	25/7½

Name.	April 7.	March 31.
International Nickel Co. of Canada, Ltd. Cum.	$50\frac{1}{4}$	$49\frac{1}{4}$
Johnson, Matthey & Co., Ltd. 5% Cum. Pref. (£5)	105/-	105/-
,, 4% Mort. Deb. Red. (£100)	£98/10/-	£98/10/-
Laporte, B., Ltd. Ord.	120/-	120/-
Lawes Chemical Co., Ltd. Ord. (10/-)	8/9	8/9
,, 7% Non-Cum. Part Pref. (10/-)	10/-	10/-
Lever Bros., Ltd. 7% Cum. Pref.	32/6	31/6
,, 8% Cum. "A" Pref.	33/3	32/6
,, 20% Cum. Prefd. Ord.	80/-	79/$4\frac{1}{2}$
,, 5% Cons. Deb. (£100)	£106/10/-	£106/10/-
,, 4% Cons. Deb. (£100)	£104/10/-	£104/10/-
Magadi Soda Co., Ltd. $12\frac{1}{2}$% Pref. Ord. (5/-)	1/3	1/3
,, 6% 2nd Pref. (5/-)	6d.	6d.
,, 6% 1st Debs. (Reg.)	£40	£40
Major & Co., Ltd. Ord. (5/-)	$7\frac{1}{2}$d.	$7\frac{1}{2}$d.
,, 8% Part. Prefd. Ord. (10/-)	9d.	9d.
,, $7\frac{1}{2}$% Cum. Pref.	$1/6\frac{3}{4}$	$1/6\frac{3}{4}$
Pinchin, Johnson & Co., Ltd. Ord. (10/-)	46/6	46/-
,, 1st Pref. $6\frac{1}{2}$% Cum.	32/-	32/-
Potash Syndicate of Germany (Deutsches Kalisyndikat G.m.b.H.) 7% Gld. Ln. Sr. "A" and "B" Rd.	£71	£72/10/-

Name.	April 7.	March 31.
Reckit & oSns, Ltd. Ord.	115/-	113/9
,, $4\frac{1}{2}$% Cum. 1st Pref.	24/$4\frac{1}{2}$	24/$4\frac{1}{2}$
Salt Union, Ltd. Ord.	45/-	45/-
,, Pref.	48/$1\frac{1}{2}$	48/$1\frac{1}{2}$
,, $4\frac{1}{2}$% Deb. (£100)	£107/10/-	£107/10/-
South Metropolitan Gas Co. Ord. (£100)	£124/10/-	£122/10/-
,, 6% Irred. Pref. (£100)	£149/10/-	£149/10/-
,, 4% Pref. (Irred.) (£100)	£105/10/-	£105/10/-
,, Perpetual 3% Deb. (£100)	£90/10/-	£89/10/-
,, 5% Red. Deb. 1950-60 (£100)	£115/10/-	£115/10/-
Staveley Coal and Iron Co., Ltd. Ord.	53/9	53/$1\frac{1}{2}$
Stevenson & Howell, Ltd. $6\frac{1}{2}$% Cum. Pref.	26/3	26/3
Triplex Safety Glass Co., Ltd. Ord. (10/-)	91/3	87/6
Unilever, Ltd. Ord.	33/$1\frac{1}{2}$	32/6
,, 7% Cum. Pref.	30/3	29/9
United Glass Bottle Manufacturers, Ltd. Ord.	45/-	44/$4\frac{1}{2}$
,, $7\frac{1}{2}$% Cum. Pref.	32/6	32/6
United Molasses Co., Ltd. Ord. (6/8)	23/9	23/9
,, 6% Cum. Pref.	26/3	26/3
United Premier Oil & Cake Co., Ltd. Ord. (5/-)	11/$10\frac{1}{2}$	12/6
,, 7% Cum. Pref.	25/-	25/-
,, $4\frac{3}{4}$% Deb. Red. (£100)	£104	£104

Inventions in the Chemical Industry

THE following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Specifications Open to Public Inspection

ANTHRAQUINONE DERIVATIVES, manufacture.—A. Carpmael (I. G. Farbenindustrie). Aug. 28, 1934. 443,958.

ANTHRAQUINONE DERIVATIVES, manufacture.—A. Carpmael (I. G. Farbenindustrie). Aug. 28, 1934. 443,959.

MONOAZO DYESTUFFS, manufacture.—A. Carpmael (I. G. Farbenindustrie). Aug. 29, 1934. 443,898.

TREATING AMMONIACAL LIQUORS, process.—Low Temperature Carbonisation, Ltd., and N. Flack. Aug. 29, 1934. 443,899.

ASCORBIC ACID and its analogues, manufacture.—W. N. Haworth, E. L. Hirst, J. K. N. Jones and F. Smith. Sept. 1, 1934. 443,901.

UNSATURATED HYDROXY-KETONES related to the corpus luteum hormone, manufacture.—W. P. Williams (Schering-Kahlbaum A.-G.). Sept. 3, 1934. 443,964.

TEXTILE ASSISTANTS.—Imperial Chemical Industries, Ltd., and A. W. Baldwin. Sept. 4, 1934. 443,902.

TANNING MATERIALS, manufacture.—A. Carpmael (I. G. Farbenindustrie). Sept. 4, 1934. 443,967.

EXPLOSIVES, manufacture.—G. Rotter, F. Holden, W. M. Burden, H. H. Hazel and L. J. L. Hammond. Sept. 6, 1934. 443,905.

SYNTHETIC METHANOL, purification.—Coutts and Co., and F. Johnson (Legal representatives of J. Y. Johnson (deceased)) (I. G. Farbenindustrie). Sept. 7, 1934. 444,019.

3:4:6-TRIAMINOQUINOLINES, manufacture.—I. G. Farbenindustrie). Sept. 28, 1933. 443,916.

SPINNING VISCOSE, process.—I. G. Farbenindustrie. Oct. 10, 1933. 443,971.

PIGMENT COLOUR from n-dihydro-1:2:2^1:1^1-anthraquinone azine, manufacture.—E. I. du Pont de Nemours and Co. Sept. 8, 1933. 443,972.

COMPOSITIONS for use in the textile industry.—I. G. Farbenindustrie. Sept. 12, 1933. 444,071.

BLUE PIGMENT COLOURS, manufacture.—I. G. Farbenindustrie. Sept. 13, 1933. 444,110.

POLYMERISATION PRODUCTS OF VINYL ETHERS, manufacture and production.—Coutts and Co., and F. Johnson (Legal representatives of J. Y. Johnson (deceased)) (I. G. Farbenindustrie). Sept. 24, 1934. 443,978.

SEPARATION OF PROPYL ETHER from mixtures of the same with propyl alcohol.—Coutts and Co., and F. Johnson (Legal representatives of J. Y. Johnson (deceased)) (I. G. Farbenindustrie). Oct. 1, 1934. 444,117.

Specifications Accepted with Date of Application

CONDENSATION PRODUCTS FROM 2.3-HYDROXYNAPHTHOIC ACID, process for manufacture.—I. G. Farbenindustrie. Aug. 30, 1933. 443,583.

OIL COMPOSITIONS suitable for use as softeners for cellulose derivatives, production.—E. I. Du Pont De Nemours and Co. Sept. 26, 1933. 443,584.

BLEACHING, WASHING AND CLEANSING AGENTS, particularly for use in water containing iron.—W. J. Tennant (Henkel and Cie, Ges.). Aug. 31, 1934. 443,731.

DYEING AND PRINTING VEGETABLE FIBRES or artificial fibres of regenerated cellulose by means of leuco sulphuric acid ester salts of vat dyestuffs.—I. G. Farbenindustrie. Sept. 1, 1933. 443,588.

ACID AND WATERPROOF CEMENT.—F. D. Snell. Sept. 1, 1934. 443,592.

NON-INFLAMMABLE PLASTIC MASSES.—W. D. Spencer, F. T. Walker and Imperial Chemical Industries, Ltd. Sept. 3, 1934. 443,645.

WATER-SOFTENING REAGENTS and methods of making the same.—Victor Chemical Works. Sept. 5, 1933. 443,782.

PHOTOGRAPHIC ANTI-HALATION LAYERS and filter layers, manufacture.—I. G. Farbenindustrie. Oct. 4, 1933. 443,790.

AZO DYESTUFFS, process for manufacture.—A. Carpmael (I. G. Farbenindustrie). Sept. 6, 1934. 443,841.

PHOTOGRAPHIC GELATINE EMULSIONS, production.—W. W. Groves (I. G. Farbenindustrie). Sept. 7, 1934. 443,843.

TREATMENT OF SOLIDS WITH LIQUIDS if desired in the presence of gases, apparatus.—A. Carpmael (Duisburger Kupferhütte, and I. G. Farbenindustrie). Sept. 11, 1934. 443,848.

SEPARATION OF UNDISSOLVED LIQUID or solid constituents from liquids, apparatus.—Coutts and Co., and F. Johnson. (Legal representatives of J. Y. Johnson (deceased)) (I. G. Farbenindustrie.) Sept. 17, 1934. 443,601.

Applications for Patents

(March 5 to March 11 inclusive.)

SOLUBILISED KETONES, manufacture.—M. Engelmann and E. I. du Pont de Nemours and Co. 7272.

THIOCARBANILID DERIVATIVE, process of making.—Franco Wyoming Oil Co. (United States, March 20, '25.) 7045.

THIOCARBANILID DERIVATIVE, process of making.—Franco Wyoming Oil Co. (United States, March 20, '35.) 7046.

VAT DYESTUFFS of the rubicene series, manufacture.—W. W. Groves (I. G. Farbenindustrie). 6815.

PRINTING WITH VAT DYESTUFFS.—W. W. Groves (I. G. Farbenindustrie). 69544.

PHOTOGRAPHIC COLOUR PRINTING.—W. W. Groves (I. G. Farbenindustrie). 7215.

SAFETY DEVICE for distillation apparatus.—Imperial Chemical Industries, Ltd. 6718.

HEAT-TREATMENT PROCESSES.—Imperial Chemical Industries, Ltd. 6879.

DYESTUFFS, production.—G. W. Johnson (I. G. Farbenindustrie). 6692.

VAT DYESTUFFS, production.—G. W. Johnson (I. G. Farbenintrie). 6836.

CHLORBUTADIENE, production.—G. W. Johnson (I. G. Farbenindustrie). 6901.

TRIARYLMETHANE DYESTUFFS containing metal, production.—G. W. Johnson (I. G. Farbenindustrie). 6902.

PHOSPHATIDE CONDENSATION PRODUCTS.—Magna Rubber Co., Ltd., and J. Talalay. (Sept. 10, '34.) 7268.

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

Japan.—A number of inquiries have been received from Japanese firms who are desirous of getting into touch with United Kingdom exporters of industrial chemicals, intermediate chemicals and dyestuffs, heavy chemicals and laboratory reagents, chemicals for tanning, leather-making and soap-making. (Ref. No. 237.)

Japan.—A firm of importers and exporters is desirous of forming connections with United Kingdom exporters of industrial chemicals, machine tools and general machinery. (Ref. No. 238.)

New Companies Registered

New-Process Gases, Ltd.—Registered April 1. Nominal capital £1,500. Dealers in and manufacturers of all types of commercial gases and all types of equipment for use with commercial gases, etc. A subscriber: Eric L. Midgley, 638 Abbey Lane, Sheffield, 11.

Vollmann Brothers, Ltd.—Registered April 2. Nominal capital £4,000. Manufacturers of and dealers in chemicals, chemical products, paints, colours, lacquers, dye-stuff, etc. A subscriber: Hermann F. Vollmann, 14 Greencroft Gardens, N.W.6.

Forthcoming Events

BRISTOL

Apr. 16.—Chemical Society. Ninety-fifth annual general meeting. Bristol University. Business meeting, 4.15. Presidential address by Professor N. V. Sidgwick, 4.45. Anniversary dinner, 7.30 for 8 p.m.

LONDON

Apr. 15.—Electrodepositors' Technical Society. "Pickling and Plating Brittleness of Steel." H. Sutton. 8.15 p.m. Northampton Polytechnic Institute, St. John Street, Clerkenwell, London.

GLASGOW

Apr. 17.—Society of Dyers and Colourists (Scottish Section). General meeting of the Section. Smoking Concert. 7 p.m. St. Enoch Hotel, Glasgow.

LIVERPOOL

Apr. 16.—Institute of Chemistry (Liverpool Section). Annual general meeting. "The Determination of Alcohol—A General Survey." A. T. Parsons and H. L. Bolton. 7.30 p.m. Constitutional Club, India Buildings, Water Street, Liverpool.

MANCHESTER

Apr. 17.—Oil and Colour Chemists' Association (Manchester Section). Annual general meeting and smoker. "The Manchester" Ltd.

Company News

British Tar Products.—The payment is announced of 6¼ per cent., less tax, on both preferred ordinary and ordinary shares.

Union Carbide and Carbon Co.—The net income for 1935, after taxes, depreciation and fixed charges, is stated to be $27,254,249, an increase over that for 1934.

Tharsis Sulphur and Copper Co.—The report for 1935 shows net profit £76,420, against £62,617, to which is added £114,867 brought in, making £191,286. The dividend is the same as last year at 5 per cent., less tax, £62,500, leaving to go forward £128,787.

Van Den Berghs.—At £444,950 net earnings show an increase of £12,240 on the 1934 figure of £432,710. The payment on the ordinary stock is increased from 12½ per cent. to 15 per cent., and £10,000 is transferred to reserve. An additional sum of £90,000 tax refund is also placed to this fund, which is thus brought up to £600,000. The carry-forward is up from £91,875 to £125,302.

Jurgens.—The net earnings before tax of Jurgens, which owns a controlling interest in English Margarine Works, advanced in 1935 by £38,485, to £360,249. The dividend on the £2,500,000 ordinary stock, which is held by Unilever, is raised from 5 per cent. to 6 per cent. This absorbs £116,250, leaving the carry-forward £32,388 higher at £162,455.

Wright, Layman and Umney, Ltd.—A dividend of 5 per cent., less tax, is announced on the ordinary shares and distribution of 2½d. per share from profit on sale of investments, not liable to tax. A similar distribution of 9⅜d. per share was made in August last. The total dividend for 1934 was 10 per cent., less tax. From 1935 profits £10,000 is placed to reserve, £1,500 to currency reserve, £500 to special contingency reserve and £6,681 is carried forward.

William Blythe.—The net profit for 1935 is reported to be £33,547, against £32,453 in the previous year. The sum of £2,450 is reserved for tax; to depreciation reserve is placed £1,515, leaving £29,582. The final dividend on the ordinary shares is 7 per cent., making 10 per cent., less tax. To general reserve is placed £5,000; further transfer to depreciation reserve £2,907, leaving to be carried forward £5,225.

Hadfields, Ltd.—An improvement in profits is reported for 1935. Trading profits and fees, after making provision for depreciation amounted to £158,993, compared with £140,183 in 1934, when no provision for depreciation was made from profits. Net profits, after debenture interest, etc., were £116,694, against £93,995 in 1934. The 1935 figure is the best since 1927. Ordinary dividends are resumed after a lapse of five years, with a payment of 7½ per cent. The last payment was 2½ per cent. for 1929. The capital reduction scheme, under which £929,892 was written off the ordinary share capital, reducing the shares to 10s. each, was sanctioned in May last. From the amount of £88,699 brought in £38,183 is deducted under the capital scheme, leaving £50,516. After providing £10,462 for the preference dividend and £54,049 for the ordinary dividend, the carry-forward is increased to £102,697.

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